



**Coimisiún na Scrúduithe Stáit**  
**State Examinations Commission**

**Leaving Certificate 2026**

**Marking Scheme**

**Biology**

**Ordinary Level**

## **Note to teachers and students on the use of published marking schemes**

Marking schemes published by the State Examinations Commission are not intended to be standalone documents. They are an essential resource for examiners who receive training in the correct interpretation and application of the scheme. This training involves, among other things, marking samples of student work and discussing the marks awarded, so as to clarify the correct application of the scheme. The work of examiners is subsequently monitored by Advising Examiners to ensure consistent and accurate application of the marking scheme. This process is overseen by the Chief Examiner, usually assisted by a Chief Advising Examiner. The Chief Examiner is the final authority regarding whether or not the marking scheme has been correctly applied to any piece of candidate work.

Marking schemes are working documents. While a draft marking scheme is prepared in advance of the examination, the scheme is not finalised until examiners have applied it to candidates' work and the feedback from all examiners has been collated and considered in light of the full range of responses of candidates, the overall level of difficulty of the examination and the need to maintain consistency in standards from year to year. This published document contains the finalised scheme, as it was applied to all candidates' work.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with their Advising Examiners when in doubt.

## **Future Marking Schemes**

Assumptions about future marking schemes on the basis of past schemes should be avoided. While the underlying assessment principles remain the same, the details of the marking of a particular type of question may change in the context of the contribution of that question to the overall examination in a given year. The Chief Examiner in any given year has the responsibility to determine how best to ensure the fair and accurate assessment of candidates' work and to ensure consistency in the standard of the assessment from year to year. Accordingly, aspects of the structure, detail and application of the marking scheme for a particular examination are subject to change from one year to the next without notice.

## Introduction

The marking scheme is a guide to awarding marks to candidates' answers. It is a concise and summarised guide and is constructed so as to minimise its word content. Examiners must conform to this scheme and may not allow marks for answering outside this scheme. The scheme contains key words, terms and phrases for which candidates may be awarded marks. This does not preclude synonyms or terms or phrases which convey the same meaning as the answer in the marking scheme. Although synonyms are generally acceptable, there may be instances where the scheme demands an exact scientific term or unequivocal response and will not accept alternatives. The descriptions, methods and definitions in the scheme are not exhaustive and alternative valid answers are acceptable. If it comes to the attention of an examiner that a candidate has presented a valid answer and there is no provision in the scheme for accepting this answer, then the examiner must first consult with his/ her advising examiner before awarding marks. As a general rule, if in doubt about any answer, examiners should consult their advising examiner before awarding marks.

## How to use the marking scheme

- Where only one answer is required alternative answers are separated by 'or'.
- Where multiple answers are required each word, term or phrase for which marks are allocated is separated by a solidus ( / ) from the next word, term or phrase.
- The mark awarded for an answer appears in **bold** next to the answer, e.g. **3**.
- Where there are several parts in the answer to a question, the mark awarded for each part appears in brackets, e.g. **5(4)** means that there are five parts to the answer, each part allocated **4 marks**.
- The answers to subsections of a question may not necessarily be allocated a specific mark, e.g. there may be six parts to a question – (a), (b), (c), (d), (e), (f) and a total of **20 marks** allocated to the question. The marking scheme might be as follows, **2(4) + 4(3)**. This means that the first two correct answers encountered are awarded **4 marks** each and each subsequent correct answer is awarded **3 marks**.
- A word or term that appears in brackets ( ) is not a requirement of the answer, but is used to contextualise the answer or may be an alternative valid answer.

## Some examples of the marking process

1. **Key words or terms or phrases may be awarded marks, only if presented in the correct context.**

**Sample question:** *Outline how you quantified a named animal in your habitat study.*

**Marking scheme states:** Named animal / captured / method of capture / counted / released / recaptured / data recorded / calculation described  
**Any four 4(3)**

**Sample answer:** *I captured hares using a pooter and counted them.*

Although the candidate has named an animal, mentioned that it was captured, and how they caught it, the method of capture is not correct with regard to the animal. The candidate's answer can only be awarded **3(3)**.

2. **Cancelled Answers**

The following is an extract from **S.63 Instructions to Examiners, 2026** (for subjects being marked online) (section 5.4, p.18):

*"Where a candidate answers a question or part of a question once only and then cancels the answer, you should ignore the cancelling and treat the answer as if the candidate had not cancelled it."*

**Sample question:** *What is pollination?*

**Marking scheme states:** Transfer of pollen / from anther / to stigma. **3(3)**

**Sample answer:** ~~*Transfer of pollen by insect to stigma.*~~

The candidate has cancelled the answer and has not made another attempt to answer the question. The candidate may be awarded **2(3)** marks.

If an answer is cancelled and an alternative version given, the cancellation should be accepted and marks awarded, where merited, for the un-cancelled version only.

If two (or more) un-cancelled versions of an answer are given to the same question or part of a question, both (or all) should be marked and the answer accepted that yields the greater (greatest) number of marks. Points may not, however, be combined from multiple versions to arrive at a manufactured total.

3. **Surplus Answers: [only in Section A] - A surplus wrong answer cancels the marks awarded for a correct answer.**

(i) **Sample question 1:** *The walls of xylem vessels are reinforced with.....*

**Marking scheme states:** Lignin **4 marks**

**Sample answer:** *Chitin, lignin*

There is a surplus incorrect answer, therefore the candidate scores **4 – 4 = 0 marks**.

**Sample answer:**            *~~Lignin~~*

The answer, which is correct, has been cancelled by the candidate, but there is no additional or surplus answer, therefore the candidate may be awarded **4 marks**.

**Sample answer:**            *Lignin, ~~chitin~~*

There is a surplus answer, which is incorrect, but it has been cancelled and as the candidate has given more than one answer (i.e. the candidate is answering the question more than once only), the cancelling can be accepted and s/he may be awarded **4 marks**.

(ii) **Sample question 2:**        *Name the four elements that are always present in protein.*

**Marking scheme states:** Carbon / hydrogen / oxygen / nitrogen **4(3)**

**Sample answer:**            *Carbon, hydrogen, oxygen, nitrogen, calcium*

There is a surplus answer, which is incorrect, which cancels one of the correct answers, therefore the candidate is awarded **3(3)** marks.

**Sample answer:**            *Carbon, hydrogen, oxygen, calcium*

There is no surplus answer – there are three correct answers, and therefore the candidate is awarded **3(3)** marks.

**Sample answer:**            *Carbon, hydrogen, oxygen, calcium, aluminium*

There is a surplus answer, which is incorrect, and cancels one of the three correct answers, therefore the candidate is awarded **2(3)** marks.

**Sample answer:**            *Carbon, hydrogen, oxygen, calcium, ~~aluminium~~*

There is a surplus answer, which is incorrect, but it has been cancelled so the candidate may be awarded **3(3)** marks.

In the other sections of the paper (Sections B and C), there may be instances where a correct answer is nullified by the addition of an incorrect answer. This happens when the only acceptable answer is a specific word or term. Each such instance is indicated in the scheme by an asterisk \*.

### Annotations used in the marking

The scripts were marked by examiners using an online marking platform. The following table illustrates the various annotations (symbols) applied by the examiners when marking the scripts. The meaning and use of each of the annotations applied are also explained in the table. These annotations will be seen on a script if viewed as part of the appeal process. Annotations applied by an examiner will be viewed in red. Scripts that were also marked by an advising examiner will show annotations in a green colour.

| Annotation                                                                          | Meaning                                                                                                |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|    | 'n' marks awarded; e.g. 1 – 4                                                                          |
|    | This symbol indicates an incorrect response/answer.                                                    |
|    | No marks awarded.                                                                                      |
|    | This symbol is placed on all blank pages or part of page to indicate it has been seen by the examiner. |
|  | This symbol can be used by an examiner to indicate a part of a question answer of significance.        |
|  | Surplus incorrect answer. A surplus incorrect answer has cancelled a correct answer.                   |

### Grading Table

| Mark      | Grade |
|-----------|-------|
| 360 – 400 | 1     |
| 320 – 359 | 2     |
| 280 – 319 | 3     |
| 240 – 279 | 4     |
| 200 – 239 | 5     |
| 160 – 199 | 6     |
| 120 – 159 | 7     |

## Bonus marks for answering through the medium of Irish

Bonus marks at the rate of 10% of the marks obtained will be given to a candidate who answers entirely through Irish and who obtains 75% or less of the total mark available in (i.e. 300 marks or less). In calculating the bonus to be applied, decimals are always rounded down, not up – e.g., 4.5 becomes 4; 4.9 becomes 4, etc. See below for when a candidate is awarded more than 300 marks.

### *Marcanna Breise as ucht freagairt trí Ghaeilge*

Léiríonn an tábla thíos an méid marcanna breise ba chóir a bhronnadh ar iarrthóirí a ghnóthaíonn níos mó ná 75% d'iomlán na marcanna.

N.B. Ba chóir marcanna de réir an ghnáthrata a bhronnadh ar iarrthóirí nach ghnóthaíonn níos mó ná 75% d'iomlán na marcanna don scrúdú. Ba chóir freisin an marc bónais sin **a shlánú síos**.

#### *Tábla 400 @ 10%*

Bain úsáid as an tábla seo i gcás na n-ábhar a bhfuil 400 marc san iomlán ag gabháil leo agus inarb é 10% gnáthrata an bhónais.

Bain úsáid as an ngnáthrata i gcás 300 marc agus faoina bhun sin. Os cionn an mharc sin, féach an tábla thíos.

| Bunmharc  | Marc Bónais |
|-----------|-------------|
| 301 - 303 | 29          |
| 304 - 306 | 28          |
| 307 - 310 | 27          |
| 311 - 313 | 26          |
| 314 - 316 | 25          |
| 317 - 320 | 24          |
| 321 - 323 | 23          |
| 324 - 326 | 22          |
| 327 - 330 | 21          |
| 331 - 333 | 20          |
| 334 - 336 | 19          |
| 337 - 340 | 18          |
| 341 - 343 | 17          |
| 344 - 346 | 16          |
| 347 - 350 | 15          |

| Bunmharc  | Marc Bónais |
|-----------|-------------|
| 351 - 353 | 14          |
| 354 - 356 | 13          |
| 357 - 360 | 12          |
| 361 - 363 | 11          |
| 364 - 366 | 10          |
| 367 - 370 | 9           |
| 371 - 373 | 8           |
| 374 - 376 | 7           |
| 377 - 380 | 6           |
| 381 - 383 | 5           |
| 384 - 386 | 4           |
| 387 - 390 | 3           |
| 391 - 393 | 2           |
| 394 - 396 | 1           |
| 397 - 400 | 0           |

|                  |               |            |
|------------------|---------------|------------|
| <b>Section A</b> | <b>Best 5</b> | <b>100</b> |
|------------------|---------------|------------|

| Question 1   |                                                                                                         | 20                                  |  |   |   |    |    |    |
|--------------|---------------------------------------------------------------------------------------------------------|-------------------------------------|--|---|---|----|----|----|
| 5(4)         |                                                                                                         |                                     |  |   |   |    |    |    |
| (a)          | Which <b>one</b> of the following biomolecules contains nitrogen?<br>Put a tick (✓) in the correct box. |                                     |  |   |   |    |    |    |
|              | Carbohydrate                                                                                            | <input type="checkbox"/>            |  |   |   |    |    |    |
|              | Protein                                                                                                 | <input checked="" type="checkbox"/> |  |   |   |    | 4  |    |
| (b)          | Name a food which is a good source of carbohydrate in the diet.                                         |                                     |  |   |   |    |    |    |
|              | Bread <b>or</b> rice <b>or</b> pasta <b>or</b> potato <b>or</b> other correct                           |                                     |  |   |   |    | 4  |    |
| (c)          | Name a food which is a good source of fat in the diet.                                                  |                                     |  |   |   |    |    |    |
|              | Milk <b>or</b> yoghurt <b>or</b> butter <b>or</b> olive oil <b>or</b> other correct                     |                                     |  |   |   |    | 4  |    |
| (d)          | Give <b>one</b> example of a <b>fat</b> -soluble vitamin.                                               |                                     |  |   |   |    |    |    |
|              | A <b>or</b> D <b>or</b> E <b>or</b> K                                                                   |                                     |  |   |   |    | 4  |    |
| (e)          | Name <b>another</b> trace element required by organisms.                                                |                                     |  |   |   |    |    |    |
|              | Iron <b>or</b> copper <b>or</b> other correct                                                           |                                     |  |   |   |    |    |    |
|              | Accept correct chemical symbol                                                                          |                                     |  |   |   |    | 4  |    |
|              |                                                                                                         |                                     |  |   |   |    |    |    |
| Q1 (a) – (e) |                                                                                                         | Number of correct responses         |  | 1 | 2 | 3  | 4  | 5  |
|              |                                                                                                         | Mark                                |  | 4 | 8 | 12 | 16 | 20 |

| Question 2                                         |                                                                  |                             |  |  |   |   |   |    |    | 20                                  |                                     |
|----------------------------------------------------|------------------------------------------------------------------|-----------------------------|--|--|---|---|---|----|----|-------------------------------------|-------------------------------------|
| 6(3) + (2)                                         |                                                                  |                             |  |  |   |   |   |    |    |                                     |                                     |
| Indicate whether the statements are true or false: |                                                                  |                             |  |  |   |   |   |    |    | True                                | False                               |
| (a)                                                | A hypothesis is always formulated at the end of an experiment.   |                             |  |  |   |   |   |    |    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (b)                                                | 'Careful planning and design' is a principle of experimentation. |                             |  |  |   |   |   |    |    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| (c)                                                | A control is used as a comparison to the test in an experiment.  |                             |  |  |   |   |   |    |    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| (d)                                                | Replicates are never required during experimentation.            |                             |  |  |   |   |   |    |    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (e)                                                | A theory is a supported hypothesis.                              |                             |  |  |   |   |   |    |    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| (f)                                                | Data generated from an experiment is always numerical.           |                             |  |  |   |   |   |    |    | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| (g)                                                | A scientific journal is used to publish new research.            |                             |  |  |   |   |   |    |    | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Q2 (a) – (g)                                       |                                                                  | Number of correct responses |  |  | 1 | 2 | 3 | 4  | 5  | 6                                   | 7                                   |
|                                                    |                                                                  | Mark                        |  |  | 3 | 6 | 9 | 12 | 15 | 18                                  | 20                                  |



Question 3

20

5(4)

Choose **each** term from the following list and place it in Column B to match a description in Column A. The first one has been completed as an example.

Haploid

Ribosome

Nucleus

Vacuole

Mitosis

Osmosis

| Column A                                                                                                                                                      | Column B |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| One set of chromosomes                                                                                                                                        | Haploid  |
| (a) An organelle that stores water in plants cells.                                                                                                           | Vacuole  |
| (b) Controls the activities of a cell.                                                                                                                        | Nucleus  |
| (c) Movement of water molecules from a region of higher water concentration to a region of lower water concentration across a selectively permeable membrane. | Osmosis  |
| (d) Site of protein synthesis.                                                                                                                                | Ribosome |
| (e) Nuclear division where two genetically identical nuclei are produced.                                                                                     | Mitosis  |

4

4

4

4

4

|              |                             |   |   |    |    |    |
|--------------|-----------------------------|---|---|----|----|----|
| Q3 (a) – (e) | Number of correct responses | 1 | 2 | 3  | 4  | 5  |
|              | Mark                        | 4 | 8 | 12 | 16 | 20 |

| Question 4                                                                                                                                                                                                                 |                                                                                                         | 20 |              |                             |    |    |   |   |   |      |   |   |    |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----|--------------|-----------------------------|----|----|---|---|---|------|---|---|----|----|----|
| 5(4)                                                                                                                                                                                                                       |                                                                                                         |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| (a)                                                                                                                                                                                                                        | Name <b>one</b> of the biologists.                                                                      |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
|                                                                                                                                                                                                                            | (Charles) Darwin <b>or</b> (Alfred Russell-)Wallace                                                     | 4  |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| (b)                                                                                                                                                                                                                        | Name any <b>one</b> these sources of evolution <b>or</b> any other <b>one</b> you have studied.         |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
|                                                                                                                                                                                                                            | Comparative embryology <b>or</b> comparative anatomy <b>or</b> fossils <b>or</b> other correct          | 4  |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| (c)                                                                                                                                                                                                                        | Comment on <b>each</b> of these terms.                                                                  |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| (i)                                                                                                                                                                                                                        | Rate of reproduction.                                                                                   |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
|                                                                                                                                                                                                                            | High rate <b>or</b> large numbers produced                                                              | 4  |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| (ii)                                                                                                                                                                                                                       | Adaptations of organisms.                                                                               |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
|                                                                                                                                                                                                                            | (Adaptations) that make an organism suited to their environment for survival (or reference to survival) | 4  |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| (iii)                                                                                                                                                                                                                      | Resources.                                                                                              |    |              |                             |    |    |   |   |   |      |   |   |    |    |    |
|                                                                                                                                                                                                                            | Food in short supply <b>or</b> mates in short supply <b>or</b> space in short supply                    | 4  |              |                             |    |    |   |   |   |      |   |   |    |    |    |
| <table><tr><td rowspan="2">Q4 (a) – (c)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Mark</td><td>4</td><td>8</td><td>12</td><td>16</td><td>20</td></tr></table> |                                                                                                         |    | Q4 (a) – (c) | Number of correct responses | 1  | 2  | 3 | 4 | 5 | Mark | 4 | 8 | 12 | 16 | 20 |
| Q4 (a) – (c)                                                                                                                                                                                                               | Number of correct responses                                                                             | 1  |              | 2                           | 3  | 4  | 5 |   |   |      |   |   |    |    |    |
|                                                                                                                                                                                                                            | Mark                                                                                                    | 4  | 8            | 12                          | 16 | 20 |   |   |   |      |   |   |    |    |    |

| Question 5   |                                                                                                                          | 20                          |  |   |   |   |    |    |    |    |
|--------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------|--|---|---|---|----|----|----|----|
| 6(3) + (2)   |                                                                                                                          |                             |  |   |   |   |    |    |    |    |
| (a)          | Identify a producer in the food web above.                                                                               |                             |  |   |   |   |    |    |    |    |
|              | Oak tree or Blackberry bush                                                                                              |                             |  |   |   |   |    |    |    |    |
| (b)          | Identify a primary consumer from the food web above.                                                                     |                             |  |   |   |   |    |    |    |    |
|              | Earthworm or Squirrel or Caterpillar or Fox or Wood Mouse or Shrew                                                       |                             |  |   |   |   |    |    |    |    |
| (c)          | Name a carnivore in the food web above.                                                                                  |                             |  |   |   |   |    |    |    |    |
|              | Owl or Badger                                                                                                            |                             |  |   |   |   |    |    |    |    |
| (d)          | Write out one food chain from the food web above.                                                                        |                             |  |   |   |   |    |    |    |    |
|              | Any correct food chain                                                                                                   |                             |  |   |   |   |    |    |    |    |
|              | Food chain must start with a producer                                                                                    |                             |  |   |   |   |    |    |    |    |
|              | Arrows between organisms pointing in the correct direction                                                               |                             |  |   |   |   |    |    |    |    |
| (e)          | How many trophic (feeding) levels are in the food chain you wrote in part (d)?                                           |                             |  |   |   |   |    |    |    |    |
|              | 2 or 3 or 4                                                                                                              |                             |  |   |   |   |    |    |    |    |
|              | Must match food chain given in (d)                                                                                       |                             |  |   |   |   |    |    |    |    |
| (f)          | Place a tick (✓) in the box which best represents the percentage energy loss between each trophic level in a food chain. |                             |  |   |   |   |    |    |    |    |
|              | 90                                                                                                                       |                             |  |   |   |   |    |    |    |    |
| Q5 (a) – (f) |                                                                                                                          | Number of correct responses |  | 1 | 2 | 3 | 4  | 5  | 6  | 7  |
|              |                                                                                                                          | Mark                        |  | 3 | 6 | 9 | 12 | 15 | 18 | 20 |

| Question 6   |                                                                                                                         | 20                          |   |   |   |    |    |    |    |
|--------------|-------------------------------------------------------------------------------------------------------------------------|-----------------------------|---|---|---|----|----|----|----|
| 6(3) + (2)   |                                                                                                                         |                             |   |   |   |    |    |    |    |
| (a)          | Match the parts labelled X, Y and Z with the following terms:<br>Cell membrane, cell wall, plasmid                      |                             |   |   |   |    |    |    |    |
|              | X: Plasmid                                                                                                              |                             |   |   |   |    |    |    |    |
|              | Y: Cell membrane                                                                                                        |                             |   |   |   |    |    |    |    |
|              | Z: Cell wall                                                                                                            |                             |   |   |   |    |    |    |    |
| (b)          | Give the function of the flagellum.                                                                                     |                             |   |   |   |    |    |    |    |
|              | Movement                                                                                                                |                             |   |   |   |    |    |    |    |
| (c)          | State one factor which affects the growth of bacteria.                                                                  |                             |   |   |   |    |    |    |    |
|              | Temperature or pH or oxygen (levels) or external solute concentration or food availability or pressure or other correct |                             |   |   |   |    |    |    |    |
| (d)          | Give one example of a harmful bacterium and one example of a beneficial bacterium.                                      |                             |   |   |   |    |    |    |    |
|              | Correct harmful example given                                                                                           |                             |   |   |   |    |    |    |    |
|              | Correct beneficial example given                                                                                        |                             |   |   |   |    |    |    |    |
| Q6 (a) – (d) |                                                                                                                         | Number of correct responses | 1 | 2 | 3 | 4  | 5  | 6  | 7  |
|              |                                                                                                                         | Mark                        | 3 | 6 | 9 | 12 | 15 | 18 | 20 |

**Question 7**
**20**
**10(2)**

- (a) Complete the table below by writing **each** number (①, ②, ③, ④, ⑥, ⑦ and ⑧) next to its corresponding named part. One part (⑤) has been completed as an example.

| Named part:        | Number: |
|--------------------|---------|
| <b>Alveolus</b>    | ⑤       |
| Diaphragm          | ⑧       |
| Lungs              | ⑦       |
| Bronchus           | ②       |
| Trachea (windpipe) | ①       |
| Bronchiole         | ⑥       |
| Rings of cartilage | ④       |
| Larynx (voice box) | ③       |

- (b) In which numbered part of the diagram does exchange of gases take place?

5 (accept alveolus)

- (c) In the case of **one** of the following breathing disorders, **asthma or bronchitis**, state **one** possible cause **and one** possible treatment for the **named** disorder.

| <b>Asthma:</b>                             | <b>Bronchitis:</b>                                              |
|--------------------------------------------|-----------------------------------------------------------------|
| Cause: allergen <b>or</b> other correct    | Cause: viral <b>or</b> bacterial <b>or</b> other correct        |
| Treatment: inhaler <b>or</b> other correct | Treatment: anti-inflammatory medication <b>or</b> other correct |

| Q7 (a) – (c) | Number of correct responses | 1 | 2 | 3 | 4 | 5  | 6  | 7  | 8  | 9  | 10 |
|--------------|-----------------------------|---|---|---|---|----|----|----|----|----|----|
|              | Mark                        | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |

|                  |  |               |  |           |  |
|------------------|--|---------------|--|-----------|--|
| <b>Section B</b> |  | <b>Best 2</b> |  | <b>60</b> |  |
|------------------|--|---------------|--|-----------|--|

|                   |  |  |  |           |  |
|-------------------|--|--|--|-----------|--|
| <b>Question 8</b> |  |  |  | <b>30</b> |  |
|-------------------|--|--|--|-----------|--|

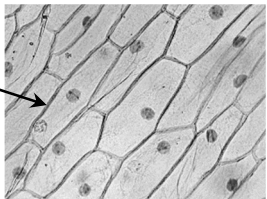
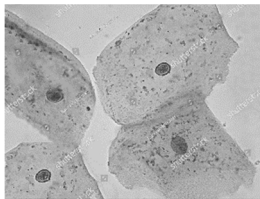
  

|             |             |                                                                                                                                                                             |                              |  |          |
|-------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|--|----------|
| <b>2(3)</b> |             |                                                                                                                                                                             |                              |  |          |
| <b>(a)</b>  | <b>(i)</b>  | Name the part of the light microscope labelled <b>A</b> .                                                                                                                   |                              |  |          |
|             |             | Eyepiece                                                                                                                                                                    |                              |  | <b>3</b> |
|             | <b>(ii)</b> | If the specimen is magnified $\times 40$ , and the power of <b>B</b> is $\times 4$ , which of the following is the power of <b>A</b> ? Place a tick (✓) in the correct box. |                              |  |          |
|             |             | x10 <input checked="" type="checkbox"/>                                                                                                                                     | x40 <input type="checkbox"/> |  | <b>3</b> |

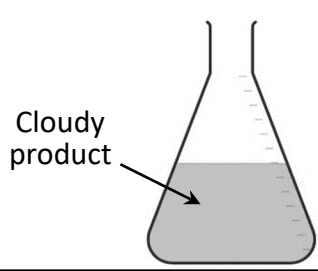
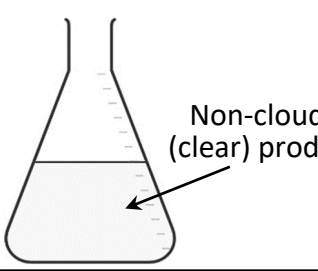
|                   |                                    |   |   |
|-------------------|------------------------------------|---|---|
| Q8 (a) (i) – (ii) | <b>Number of correct responses</b> | 1 | 2 |
|                   | <b>Mark</b>                        | 3 | 6 |

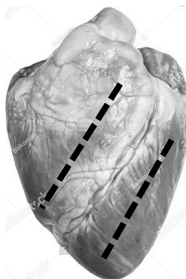
  

|             |              |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                   |          |             |
|-------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------|
| <b>8(3)</b> |              |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                   |          |             |
| <b>(b)</b>  | <b>(i)</b>   | Name the type of plant cells you used.                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | Correct type named or correctly named plant tissue                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                   |          | <b>3</b>    |
|             | <b>(ii)</b>  | Describe how you obtained the plant cells <b>and</b> how you prepared the unstained cells for viewing.                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | Cut a thin layer / place on slide / apply water / apply coverslip / place on stage                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | <b>Any three</b>                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                   |          | <b>3(3)</b> |
|             | <b>(iii)</b> | Name a stain you applied to the cells.                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | Iodine <b>or</b> methylene blue <b>or</b> other correct                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                   |          | <b>3</b>    |
|             | <b>(iv)</b>  | How did you apply the stain to the cells?                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | Pipette (allow dropper)                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                   |          | <b>3</b>    |
|             | <b>(v)</b>   | Why was a stain used in this activity?                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | Make cells more visible                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                   |          | <b>3</b>    |
|             | <b>(vi)</b>  | Which photograph below shows stained <b>plant</b> cells as seen using a light microscope? Place a tick (✓) in the correct box.                                                                                                                                                            |                                                                                                                                                                                                                                                                                   |          |             |
|             |              | <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;">Cell wall</div>  </div> <div style="text-align: center; margin-top: 5px;"><input checked="" type="checkbox"/></div> | <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;">No cell wall</div> </div> <div style="text-align: center; margin-top: 5px;"><input type="checkbox"/></div> | <b>3</b> |             |

|                   |                                    |   |   |   |    |    |    |    |    |
|-------------------|------------------------------------|---|---|---|----|----|----|----|----|
| Q8 (b) (i) – (vi) | <b>Number of correct responses</b> | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  |
|                   | <b>Mark</b>                        | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |

| Question 9                                                                                                                                                                                                                                                                                                            |                             |                                                                                                                                                           |                                     |                   |                                     |                                   |   |   |    | 30 |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------|-------------------------------------|-----------------------------------|---|---|----|----|-------------------|-----------------------------|----|---|---|------|---|---|---|---|---|---|---|---|------|--|--|--|--|---|---|---|----|----|----|----|----|
| 2(3)                                                                                                                                                                                                                                                                                                                  |                             |                                                                                                                                                           |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| (a)                                                                                                                                                                                                                                                                                                                   | (i)                         | Which <b>one</b> of the following terms best describes the shape of enzymes?                                                                              |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Fibrous                                                                                                                                                   | <input type="checkbox"/>            | Folded (globular) | <input checked="" type="checkbox"/> |                                   |   |   |    | 3  |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | (ii)                        | Which <b>one</b> of the following biomolecules makes up enzymes?                                                                                          |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Protein                                                                                                                                                   | <input checked="" type="checkbox"/> | Lipid             | <input type="checkbox"/>            |                                   |   |   |    | 3  |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| <table><tr><td rowspan="2">Q9 (a) (i) – (ii)</td><td colspan="2">Number of correct responses</td><td>1</td><td>2</td></tr><tr><td colspan="2">Mark</td><td>3</td><td>6</td></tr></table>                                                                                                                              |                             |                                                                                                                                                           |                                     |                   |                                     |                                   |   |   |    |    | Q9 (a) (i) – (ii) | Number of correct responses |    | 1 | 2 | Mark |   | 3 | 6 |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| Q9 (a) (i) – (ii)                                                                                                                                                                                                                                                                                                     | Number of correct responses |                                                                                                                                                           | 1                                   | 2                 |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | Mark                        |                                                                                                                                                           | 3                                   | 6                 |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| 8(3)                                                                                                                                                                                                                                                                                                                  |                             |                                                                                                                                                           |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| (b)                                                                                                                                                                                                                                                                                                                   | (i)                         | Name the enzyme you used.                                                                                                                                 |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Sucrase (accept yeast) <b>or</b> other correct                                                                                                            |                                     |                   |                                     |                                   |   |   |    | 3  |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | (ii)                        | Name a substance you used to immobilise the enzyme.                                                                                                       |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Sodium alginate (accept calcium chloride) <b>or</b> other correct                                                                                         |                                     |                   |                                     |                                   |   |   |    | 3  |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | (iii)                       | In the space provided below, draw a labelled diagram of the apparatus (or equipment) you used to immobilise the enzyme.                                   |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Diagram: Beaker (or relevant piece of glassware) with syringe (or other correct apparatus) in correct position                                            |                                     |                   |                                     |                                   |   |   |    | 3  |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Label: Any one correct relevant label                                                                                                                     |                                     |                   |                                     |                                   |   |   |    | 3  |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | (iv)                        | Name the <b>substrate</b> of the enzyme.                                                                                                                  |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Sucrose <b>or</b> other correct                                                                                                                           |                                     |                   |                                     | Must match named enzyme in (b)(i) |   |   | 3  |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | (v)                         | Name the <b>product</b> of the enzyme.                                                                                                                    |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       |                             | Glucose <b>or</b> fructose <b>or</b> other correct                                                                                                        |                                     |                   |                                     | Must match named enzyme in (b)(i) |   |   | 3  |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | (vi)                        | Match the terms <i>immobilised enzyme</i> <b>and</b> <i>free enzyme</i> to the diagrams below based on the type of product they will most likely produce. |                                     |                   |                                     |                                   |   |   |    |    |                   |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| <div><div><p>Free enzyme</p></div><div><p>Immobilised enzyme</p></div></div>                                                                   |                             |                                                                                                                                                           |                                     |                   |                                     |                                   |   |   |    |    | 2(3)              |                             |    |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
| <table><tr><td rowspan="2">Q9 (b) (i) – (vi)</td><td colspan="5">Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td colspan="5">Mark</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td></tr></table> |                             |                                                                                                                                                           |                                     |                   |                                     |                                   |   |   |    |    | Q9 (b) (i) – (vi) | Number of correct responses |    |   |   |      | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Mark |  |  |  |  | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |
| Q9 (b) (i) – (vi)                                                                                                                                                                                                                                                                                                     | Number of correct responses |                                                                                                                                                           |                                     |                   |                                     | 1                                 | 2 | 3 | 4  | 5  |                   | 6                           | 7  | 8 |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                       | Mark                        |                                                                                                                                                           |                                     |                   |                                     | 3                                 | 6 | 9 | 12 | 15 | 18                | 21                          | 24 |   |   |      |   |   |   |   |   |   |   |   |      |  |  |  |  |   |   |   |    |    |    |    |    |

| Question 10                                                                                                                                                                                                                                                                                    |                             |                                                                    |                                                                                                                                                              |   |    |    |    |    |    | 30 |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|----|----|--------------------|-----------------------------|---|---|------|---|---|---|---|---|------|---|---|---|----|----|----|----|----|
| 2(3)                                                                                                                                                                                                                                                                                           |                             |                                                                    |                                                                                                                                                              |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
| (a)                                                                                                                                                                                                                                                                                            | (i)                         | What is the function of the pacemaker in the heart?                |                                                                                                                                                              |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | To control the rate of the heartbeat                               |                                                                                                                                                              |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                | (ii)                        | Name a location in a plant where meristematic tissue can be found. |                                                                                                                                                              |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | Root tip <b>or</b> shoot tip <b>or</b> bud                         |                                                                                                                                                              |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
| <table><tr><td rowspan="2">Q10 (a) (i) – (ii)</td><td>Number of correct responses</td><td>1</td><td>2</td></tr><tr><td>Mark</td><td>3</td><td>6</td></tr></table>                                                                                                                              |                             |                                                                    |                                                                                                                                                              |   |    |    |    |    |    |    | Q10 (a) (i) – (ii) | Number of correct responses | 1 | 2 | Mark | 3 | 6 |   |   |   |      |   |   |   |    |    |    |    |    |
| Q10 (a) (i) – (ii)                                                                                                                                                                                                                                                                             | Number of correct responses | 1                                                                  | 2                                                                                                                                                            |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                | Mark                        | 3                                                                  | 6                                                                                                                                                            |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
| 8(3)                                                                                                                                                                                                                                                                                           |                             |                                                                    |                                                                                                                                                              |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
| (b)                                                                                                                                                                                                                                                                                            | (i)                         | 1.                                                                 | Using a dotted line (.....), indicate <b>on the photograph</b> where an incision should be made.                                                             |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    |  <p><b>Only one correctly located dotted line required for 3 marks</b></p> |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | 2.                                                                 | What instrument would be suitable to make this incision?                                                                                                     |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | Scalpel                                                                                                                                                      |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | 3.                                                                 | Which letter on the photograph ( <b>R or L</b> ) indicates the side of the heart that has the <b>thickest</b> wall?                                          |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | <b>L</b>                                                                                                                                                     |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | 4.                                                                 | State a safety precaution that should be taken during this activity.                                                                                         |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | Valid safety precaution given                                                                                                                                |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                | (ii)                        | 1.                                                                 | Which image ( <b>A or B</b> ) shows a dicot stem? Justify your answer.                                                                                       |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | <b>B</b>                                                                                                                                                     |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | Justify: Vascular bundles in a circle <b>or</b> vascular bundles not scattered                                                                               |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | 2.                                                                 | Name an instrument you used to prepare a thin section of the stem for microscopic examination.                                                               |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | Backed blade <b>or</b> scalpel                                                                                                                               |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             | 3.                                                                 | Explain why the section had to be thin.                                                                                                                      |   |    |    |    |    |    |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                |                             |                                                                    | So that light could pass through it (and show the structures)                                                                                                |   |    |    |    |    |    | 3  |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
| <table><tr><td rowspan="2">Q10 (b) (i) – (ii)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td></tr></table> |                             |                                                                    |                                                                                                                                                              |   |    |    |    |    |    |    | Q10 (b) (i) – (ii) | Number of correct responses | 1 | 2 | 3    | 4 | 5 | 6 | 7 | 8 | Mark | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |
| Q10 (b) (i) – (ii)                                                                                                                                                                                                                                                                             | Number of correct responses | 1                                                                  | 2                                                                                                                                                            | 3 | 4  | 5  | 6  | 7  | 8  |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                | Mark                        | 3                                                                  | 6                                                                                                                                                            | 9 | 12 | 15 | 18 | 21 | 24 |    |                    |                             |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |

|                  |               |            |
|------------------|---------------|------------|
| <b>Section C</b> | <b>Best 4</b> | <b>240</b> |
|------------------|---------------|------------|

|                    |           |
|--------------------|-----------|
| <b>Question 11</b> | <b>60</b> |
|--------------------|-----------|

|                                                                                                                                                                                                                     |                                    |                                                                                                 |   |          |                    |                                    |   |   |   |             |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------|---|----------|--------------------|------------------------------------|---|---|---|-------------|---|---|---|
| <b>3(3)</b>                                                                                                                                                                                                         |                                    |                                                                                                 |   |          |                    |                                    |   |   |   |             |   |   |   |
| <b>(a)</b>                                                                                                                                                                                                          | <b>(i)</b>                         | Match the words, <i>animal</i> and <i>plant</i> to the following terms: <b>Flora; Fauna.</b>    |   |          |                    |                                    |   |   |   |             |   |   |   |
|                                                                                                                                                                                                                     |                                    | Animal: *Fauna                                                                                  |   | <b>3</b> |                    |                                    |   |   |   |             |   |   |   |
|                                                                                                                                                                                                                     |                                    | Plant: *Flora                                                                                   |   | <b>3</b> |                    |                                    |   |   |   |             |   |   |   |
|                                                                                                                                                                                                                     | <b>(ii)</b>                        | Which <b>one</b> of the following describes the term <i>biotic</i> ? <b>Living; Non-living.</b> |   |          |                    |                                    |   |   |   |             |   |   |   |
|                                                                                                                                                                                                                     |                                    | *Living                                                                                         |   | <b>3</b> |                    |                                    |   |   |   |             |   |   |   |
| <table border="1"> <tr> <td rowspan="2">Q11 (a) (i) – (ii)</td><td><b>Number of correct responses</b></td><td>1</td><td>2</td><td>3</td></tr> <tr> <td><b>Mark</b></td><td>3</td><td>6</td><td>9</td></tr> </table> |                                    |                                                                                                 |   |          | Q11 (a) (i) – (ii) | <b>Number of correct responses</b> | 1 | 2 | 3 | <b>Mark</b> | 3 | 6 | 9 |
| Q11 (a) (i) – (ii)                                                                                                                                                                                                  | <b>Number of correct responses</b> | 1                                                                                               | 2 | 3        |                    |                                    |   |   |   |             |   |   |   |
|                                                                                                                                                                                                                     | <b>Mark</b>                        | 3                                                                                               | 6 | 9        |                    |                                    |   |   |   |             |   |   |   |

| 9(3)               |       |                                                                                                                                                                                                              |  |   |   |   |    |    |    |    |    |             |
|--------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---|---|---|----|----|----|----|----|-------------|
| (b)                | (i)   | Match the terms <i>habitat</i> and <i>ecosystem</i> to the following descriptions:<br><b>A: Organisms and their environment and how they interact with each other.</b><br><b>B: Where an organism lives.</b> |  |   |   |   |    |    |    |    |    |             |
|                    |       | Habitat: <b>*B or</b> where an organism lives                                                                                                                                                                |  |   |   |   |    |    |    |    |    | <b>3</b>    |
|                    |       | Ecosystem: <b>*A or</b> organisms and their environment and how they interact with each other                                                                                                                |  |   |   |   |    |    |    |    |    | <b>3</b>    |
|                    | (ii)  | Name any <b>two</b> abiotic factors mentioned in the article above.                                                                                                                                          |  |   |   |   |    |    |    |    |    |             |
|                    |       | Mild climate / wet climate / acidic soils <span style="float:right"><b>Any two</b></span>                                                                                                                    |  |   |   |   |    |    |    |    |    | <b>2(3)</b> |
|                    | (iii) | What do you understand by the term, <i>invasive</i> ?                                                                                                                                                        |  |   |   |   |    |    |    |    |    |             |
|                    |       | Taking over <b>or</b> not indigenous <b>or</b> not native                                                                                                                                                    |  |   |   |   |    |    |    |    |    | <b>3</b>    |
|                    | (iv)  | State <b>two</b> ways in which rhododendron can spread quickly throughout its habitat.                                                                                                                       |  |   |   |   |    |    |    |    |    |             |
|                    |       | One million seeds produced by one plant / animals do not eat its leaves / no competition / dispersed by wind <span style="float:right"><b>Any two</b></span>                                                 |  |   |   |   |    |    |    |    |    | <b>2(3)</b> |
|                    | (v)   | What effect does the dense coverage of rhododendron leaves have on the habitat?                                                                                                                              |  |   |   |   |    |    |    |    |    |             |
|                    |       | Smothers all growth below <b>or</b> prevent other plants from growing <b>or</b> affects the biodiversity of the soil                                                                                         |  |   |   |   |    |    |    |    |    | <b>3</b>    |
|                    | (vi)  | Ecologists in the park are clearing rhododendron.<br>Suggest <b>one</b> benefit this will have on the ecosystem.                                                                                             |  |   |   |   |    |    |    |    |    |             |
|                    |       | Allows biodiversity to be maintained or be increased <b>or</b> other correct benefit                                                                                                                         |  |   |   |   |    |    |    |    |    | <b>3</b>    |
| Q11 (b) (i) – (vi) |       | Number of correct responses                                                                                                                                                                                  |  | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9           |
|                    |       | Mark                                                                                                                                                                                                         |  | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27          |

**Question 11 (continued)**

**8(3)**

|            |              |                                                                                                                                                                               |             |
|------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| <b>(c)</b> | <b>(i)</b>   | Why is nutrient recycling important in nature?                                                                                                                                |             |
|            |              | So that nutrients can be reused (by other organisms)                                                                                                                          | <b>3</b>    |
|            | <b>(ii)</b>  | <b>1.</b> Name <b>two</b> ways in which carbon dioxide (CO <sub>2</sub> ) is released into the atmosphere during the carbon cycle.                                            |             |
|            |              | Respiration / decay / combustion / other correct <b>Any two</b>                                                                                                               | <b>2(3)</b> |
|            |              | <b>2.</b> Name <b>one</b> other nutrient cycle you have studied.                                                                                                              |             |
|            |              | Nitrogen (cycle)                                                                                                                                                              | <b>3</b>    |
|            | <b>(iii)</b> | Name <b>one</b> type of micro-organism involved in nutrient recycling.                                                                                                        |             |
|            |              | Bacteria <b>or</b> fungi                                                                                                                                                      | <b>3</b>    |
|            | <b>(iv)</b>  | State <b>two</b> problems associated with waste disposal                                                                                                                      |             |
|            |              | Unightly / smell / attracts vermin / pollution / impacts organisms / lack of landfill sites / other correct problem given <b>Any two</b>                                      | <b>2(3)</b> |
|            | <b>(v)</b>   | Give <b>one</b> way in which waste can be minimised.                                                                                                                          |             |
|            |              | Reduce <b>or</b> reuse <b>or</b> recycle <b>or</b> use renewable energy <b>or</b> promote sustainable transportation <b>or</b> avoid single use items <b>or</b> other correct | <b>3</b>    |

|                   |                                    |   |   |   |    |    |    |    |    |
|-------------------|------------------------------------|---|---|---|----|----|----|----|----|
| Q11 (c) (i) – (v) | <b>Number of correct responses</b> | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  |
|                   | <b>Mark</b>                        | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |



## Question 12

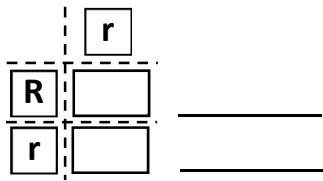
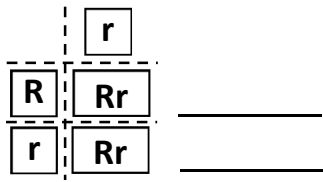
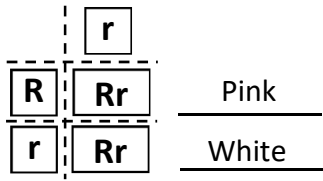
60

3(3)

|     |      |                                                                                                                                                                                                                                                              |   |
|-----|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| (a) | (i)  | Match the terms <i>genotype</i> and <i>phenotype</i> to the following sentences:<br><b>A: Physical makeup of an organism</b><br><b>B: Genetic makeup of an organism.</b>                                                                                     |   |
|     |      | Genotype: * <b>B</b> or genetic makeup of an organism                                                                                                                                                                                                        | 3 |
|     |      | Phenotype: * <b>A</b> or physical makeup of an organism                                                                                                                                                                                                      | 3 |
|     | (ii) | Which <b>one</b> of the following sentences ( <b>X</b> or <b>Y</b> ) describes the term <i>homozygous</i> ?<br><b>X: Having two different alleles that control a characteristic</b><br><b>Y: Having two identical alleles that control a characteristic.</b> |   |
|     |      | * <b>Y</b>                                                                                                                                                                                                                                                   | 3 |

|                    |                             |   |   |   |
|--------------------|-----------------------------|---|---|---|
| Q12 (a) (i) – (ii) | Number of correct responses | 1 | 2 | 3 |
|                    | Mark                        | 3 | 6 | 9 |

9(3)

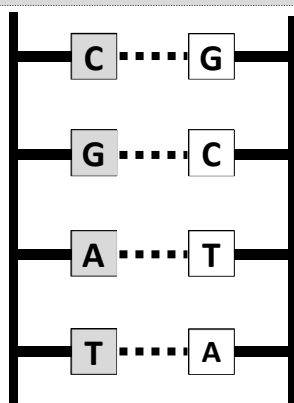
|     |       |                                                                                                        |   |
|-----|-------|--------------------------------------------------------------------------------------------------------|---|
| (b) | (i)   | Write down the genotype of a rose with pink flowers.                                                   |   |
|     |       | * <b>Rr</b>                                                                                            | 3 |
|     | (ii)  | Copy the Punnett square shown on the right into your answerbook and complete it to show the following: |   |
|     |       | 1. Genotypes of the gametes.                                                                           |   |
|     |       |                     | 3 |
|     |       |                                                                                                        | 3 |
|     |       |                                                                                                        | 3 |
|     |       | 2. Genotypes of the possible offspring.                                                                |   |
|     |       |                     | 3 |
|     |       |                                                                                                        | 3 |
|     |       | 3. Matching phenotypes of the possible offspring.                                                      |   |
|     |       |                     | 3 |
|     |       |                                                                                                        | 3 |
|     | (iii) | If this cross produced 10 new plants, how many plants would you expect there to be of each colour?     |   |
|     |       | * <b>5</b> (allow correct %)                                                                           | 3 |

|                     |                             |   |   |   |    |    |    |    |    |    |
|---------------------|-----------------------------|---|---|---|----|----|----|----|----|----|
| Q12 (b) (i) – (iii) | Number of correct responses | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  |
|                     | Mark                        | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |

**Question 12 (continued)**

**8(3)**

- (c) (i)** Copy out the diagram into your answerbook and complete the blank spaces to show the correct complementary base pairs in the DNA molecule.



**3**

**3**

**3**

**3**

- (ii) 1.** Where in a cell does transcription take place?

\*Nucleus

**3**

- 2.** Name the type of RNA that is produced during transcription.

\*Messenger RNA or mRNA

**3**

- (iii)** Give **one** structural difference between DNA and RNA.

DNA contains thymine (T) / DNA is double-stranded (double helix) / RNA contains uracil (U) / RNA is single-stranded / other correct

**Any one**

**3**

- (iv)** Give **one** application (or use) of DNA profiling.

Crime scene investigation / paternity testing / identification / other correct

**Any one**

**3**

| Q12 (c) (i) – (iv) | Number of correct responses | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  |
|--------------------|-----------------------------|---|---|---|----|----|----|----|----|
|                    | Mark                        | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |

| Question 13                                                                                                                                                                                                                                                                                                          |                             |                                                                                                                                                                                                   |   |   |    |    |    |    |    |    | 60           |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|----|----|----|----|----|----|--------------|---------------------|-----------------------------|---|---|---|------|---|---|---|---|---|------|---|---|---|----|----|----|----|----|----|
| 3(3)                                                                                                                                                                                                                                                                                                                 |                             |                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| (a)                                                                                                                                                                                                                                                                                                                  | (i)                         | Which of the sentences ( <b>A</b> or <b>B</b> ) describes the term <i>metabolism</i> ?<br><b>A: Sum of all chemical reactions in an organism</b><br><b>B: Getting rid of undigested material.</b> |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | * <b>A</b> or sum of all chemical reactions in an organism                                                                                                                                        |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (ii)                        | Which term, <i>catabolic</i> or <i>anabolic</i> describes this type of reaction?                                                                                                                  |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | *Anabolic                                                                                                                                                                                         |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (iii)                       | Name the source of light energy.                                                                                                                                                                  |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | Sun or solar                                                                                                                                                                                      |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| <table><tr><td rowspan="2">Q13 (a) (i) – (iii)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td></tr></table>                                                                                                                               |                             |                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |              | Q13 (a) (i) – (iii) | Number of correct responses | 1 | 2 | 3 | Mark | 3 | 6 | 9 |   |   |      |   |   |   |    |    |    |    |    |    |
| Q13 (a) (i) – (iii)                                                                                                                                                                                                                                                                                                  | Number of correct responses | 1                                                                                                                                                                                                 | 2 | 3 |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | Mark                        | 3                                                                                                                                                                                                 | 6 | 9 |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| 9(3)                                                                                                                                                                                                                                                                                                                 |                             |                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| (b)                                                                                                                                                                                                                                                                                                                  | (i)                         | Match compounds <b>A</b> and <b>B</b> to the following words: <b>Glucose; Water.</b>                                                                                                              |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | <b>A: *Water</b>                                                                                                                                                                                  |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | <b>B: *Glucose</b>                                                                                                                                                                                |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (ii)                        | Copy the formula <b>into your answerbook</b> and complete it by writing the correct numbers in <b>each</b> box.                                                                                   |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | $\text{C}_{\boxed{6}}\text{H}_{\boxed{12}}\text{O}_{\boxed{6}}$                                                                                                                                   |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (iii)                       | Chlorophyll is the green pigment necessary for photosynthesis.<br>Name the plant cell organelle in which it is found.                                                                             |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | *Chloroplast                                                                                                                                                                                      |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (iv)                        | Give <b>one</b> source for the carbon dioxide that is used in photosynthesis.                                                                                                                     |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | Atmosphere or respiration or other correct                                                                                                                                                        |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (v)                         | Give <b>one</b> fate for the oxygen gas that is produced during photosynthesis.                                                                                                                   |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | Released into the atmosphere or respired by animals or plants                                                                                                                                     |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (vi)                        | State what happens to <b>either</b> the electrons or the protons after they are released.                                                                                                         |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | Electrons go to chlorophyll<br>or<br>Protons go to the proton pool or make glucose                                                                                                                |   |   |    |    |    |    |    |    | 3            |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | (vii)                       | Using your knowledge of photosynthesis, give <b>two</b> ways in which crop growth in greenhouses can be increased.                                                                                |   |   |    |    |    |    |    |    |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      |                             | Increase carbon dioxide / extra light / increase temperature                                                                                                                                      |   |   |    |    |    |    |    |    | Any two 2(3) |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| <table><tr><td rowspan="2">Q13 (b) (i) – (vii)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td></tr></table> |                             |                                                                                                                                                                                                   |   |   |    |    |    |    |    |    |              | Q13 (b) (i) – (vii) | Number of correct responses | 1 | 2 | 3 | 4    | 5 | 6 | 7 | 8 | 9 | Mark | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
| Q13 (b) (i) – (vii)                                                                                                                                                                                                                                                                                                  | Number of correct responses | 1                                                                                                                                                                                                 | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                      | Mark                        | 3                                                                                                                                                                                                 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |              |                     |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |

| Question 13 (continued) |                                                                                                                                                                                                        |                             |   |   |   |    |    |    |    |              |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---|---|---|----|----|----|----|--------------|
| 8(3)                    |                                                                                                                                                                                                        |                             |   |   |   |    |    |    |    |              |
| (c)                     | Aerobic respiration is a two-stage process.                                                                                                                                                            |                             |   |   |   |    |    |    |    |              |
| (i)                     | Which stage (1. or 2.) releases the most energy?                                                                                                                                                       |                             |   |   |   |    |    |    |    |              |
|                         | *2.                                                                                                                                                                                                    |                             |   |   |   |    |    |    |    | 3            |
| (ii)                    | Which stage (1. or 2.) does not require oxygen?                                                                                                                                                        |                             |   |   |   |    |    |    |    |              |
|                         | *1.                                                                                                                                                                                                    |                             |   |   |   |    |    |    |    | 3            |
| (iii)                   | Fermentation is a type of respiration.<br>To which type of respiration (aerobic <b>or</b> anaerobic) does it belong?                                                                                   |                             |   |   |   |    |    |    |    |              |
|                         | *Anaerobic                                                                                                                                                                                             |                             |   |   |   |    |    |    |    | 3            |
| (iv)                    | Name any <b>two</b> factors that affect the rate of enzyme action.                                                                                                                                     |                             |   |   |   |    |    |    |    |              |
|                         | Temperature / pH / other correct                                                                                                                                                                       |                             |   |   |   |    |    |    |    | Any two 2(3) |
| (v)                     | Copy the axes shown <b>into your answerbook</b> . Label the axes <b>and</b> sketch a graph to show how <b>either one</b> of the factors you named in (c) (iv) above affects the rate of enzyme action. |                             |   |   |   |    |    |    |    |              |
|                         | X axis label:      pH <b>or</b> temperature                                                                                                                                                            |                             |   |   |   |    |    |    |    | 3            |
|                         | Y axis label:      rate of activity                                                                                                                                                                    |                             |   |   |   |    |    |    |    | 3            |
|                         | Shape of graph:    shape of graph must match factor given as X-axis label                                                                                                                              |                             |   |   |   |    |    |    |    | 3            |
| Q13 (c) (i) – (v)       |                                                                                                                                                                                                        | Number of correct responses | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8            |
|                         |                                                                                                                                                                                                        | Mark                        | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24           |

| Question 14                                                                                                                                                                                                                                                                                                        |                             |                                                             |                                                                                                                        |   |    |    |    |    |    |    | 60           |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---|----|----|----|----|----|----|--------------|--------------------|-----------------------------|---|---|---|------|---|---|---|---|---|------|---|---|---|----|----|----|----|----|----|
| 3(3)                                                                                                                                                                                                                                                                                                               |                             |                                                             |                                                                                                                        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| (a)                                                                                                                                                                                                                                                                                                                | (i)                         | Explain in detail the term 'balanced' diet.                 |                                                                                                                        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | (All) food types (or nutrients) present                     |                                                                                                                        |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | in correct amounts                                          |                                                                                                                        |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | (ii)                        | Give the role of peristalsis in the human digestive system. |                                                                                                                        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | To move food (through the digestive tract)                  |                                                                                                                        |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| <table><tr><td rowspan="2">Q14 (a) (i) – (ii)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td></tr></table>                                                                                                                              |                             |                                                             |                                                                                                                        |   |    |    |    |    |    |    |              | Q14 (a) (i) – (ii) | Number of correct responses | 1 | 2 | 3 | Mark | 3 | 6 | 9 |   |   |      |   |   |   |    |    |    |    |    |    |
| Q14 (a) (i) – (ii)                                                                                                                                                                                                                                                                                                 | Number of correct responses | 1                                                           | 2                                                                                                                      | 3 |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | Mark                        | 3                                                           | 6                                                                                                                      | 9 |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| 9(3)                                                                                                                                                                                                                                                                                                               |                             |                                                             |                                                                                                                        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| (b)                                                                                                                                                                                                                                                                                                                | (i)                         | What is meant by the term digestion?                        |                                                                                                                        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | The breakdown of food                                       |                                                                                                                        |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | (ii)                        | Why must food be digested?                                  |                                                                                                                        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | So it can be absorbed into the bloodstream                  |                                                                                                                        |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | (iii)                       | 1.                                                          | Which term (chemical <b>or</b> physical) is used to describe the type of digestion in which enzymes are involved?      |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | *Chemical                                                                                                              |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | 2.                                                          | Which term (chemical <b>or</b> physical) is used to describe the type of digestion in which teeth are involved?        |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | *Physical                                                                                                              |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | (iv)                        | 1.                                                          | Which labelled part ( <b>A or B or C</b> ) of the human digestive system produces acid?                                |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | *C                                                                                                                     |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | 2.                                                          | Which <b>one</b> of the following sequences represents the direction of movement of food through the alimentary canal? |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | <ul style="list-style-type: none"><li>A → B → C</li><li>B → A → C</li><li>A → C → B</li></ul>                          |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | *A → C → B                                                                                                             |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | (v)                         | 1.                                                          | Name any <b>one</b> enzyme produced by the pancreas.                                                                   |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | Amylase <b>or</b> lipase <b>or</b> other correct                                                                       |   |    |    |    |    |    |    | 3            |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             | 2.                                                          | Give <b>two</b> functions of the liver.                                                                                |   |    |    |    |    |    |    |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    |                             |                                                             | Detoxify / produce bile / deamination / breakdown red blood cells / store glycogen / other correct                     |   |    |    |    |    |    |    | Any two 2(3) |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
| <table><tr><td rowspan="2">Q14 (b) (i) – (v)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td></tr></table> |                             |                                                             |                                                                                                                        |   |    |    |    |    |    |    |              | Q14 (b) (i) – (v)  | Number of correct responses | 1 | 2 | 3 | 4    | 5 | 6 | 7 | 8 | 9 | Mark | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 |
| Q14 (b) (i) – (v)                                                                                                                                                                                                                                                                                                  | Number of correct responses | 1                                                           | 2                                                                                                                      | 3 | 4  | 5  | 6  | 7  | 8  | 9  |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                    | Mark                        | 3                                                           | 6                                                                                                                      | 9 | 12 | 15 | 18 | 21 | 24 | 27 |              |                    |                             |   |   |   |      |   |   |   |   |   |      |   |   |   |    |    |    |    |    |    |

| Question 14 (continued) |       |                                                                                                                                         |                             |  |   |   |   |    |    |    |    |    |
|-------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|--|---|---|---|----|----|----|----|----|
| 8(3)                    |       |                                                                                                                                         |                             |  |   |   |   |    |    |    |    |    |
| (c)                     | (i)   | What is the <b>main</b> function of the small intestine?                                                                                |                             |  |   |   |   |    |    |    |    |    |
|                         |       | Absorption of nutrients                                                                                                                 | 3                           |  |   |   |   |    |    |    |    |    |
|                         | (ii)  | Draw a labelled diagram of a villus.                                                                                                    |                             |  |   |   |   |    |    |    |    |    |
|                         |       | Diagram: Villus outline                                                                                                                 | 3                           |  |   |   |   |    |    |    |    |    |
|                         |       | Blood supply <b>or</b> lacteal                                                                                                          | 3                           |  |   |   |   |    |    |    |    |    |
|                         |       | Labels: Villus <b>or</b> lacteal <b>or</b> capillary (or blood vessel) <b>or</b> other correct                                          | 3                           |  |   |   |   |    |    |    |    |    |
|                         | (iii) | Which <b>one</b> of the following veins links the small intestine to the liver?<br><b>Hepatic vein; Hepatic portal vein; Renal vein</b> |                             |  |   |   |   |    |    |    |    |    |
|                         |       | *Hepatic portal vein                                                                                                                    | 3                           |  |   |   |   |    |    |    |    |    |
|                         | (iv)  | Give a function of the large intestine.                                                                                                 |                             |  |   |   |   |    |    |    |    |    |
|                         |       | Absorbs water <b>or</b> forms faeces <b>or</b> absorbs vitamins (allow absorbs nutrients)                                               | 3                           |  |   |   |   |    |    |    |    |    |
|                         | (v)   | State any <b>one</b> benefit of having a diet high in fibre.                                                                            |                             |  |   |   |   |    |    |    |    |    |
|                         |       | Prevent constipation <b>or</b> prevent overeating <b>or</b> promotes peristalsis (muscle contraction) <b>or</b> other correct           | 3                           |  |   |   |   |    |    |    |    |    |
|                         | (vi)  | Give <b>one</b> function of these symbiotic bacteria.                                                                                   |                             |  |   |   |   |    |    |    |    |    |
|                         |       | Help digest food <b>or</b> synthesis of vitamins <b>or</b> compete with pathogens                                                       | 3                           |  |   |   |   |    |    |    |    |    |
| Q14 (c) (i) – (vi)      |       |                                                                                                                                         | Number of correct responses |  | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  |
|                         |       |                                                                                                                                         | Mark                        |  | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |

| Question 15                                 |                                                                                       |                                                                                                                                                                                                                     |                                                |                 |   |   |   |             |    | 60   |    |    |    |
|---------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------|---|---|---|-------------|----|------|----|----|----|
| 3(3)                                        |                                                                                       |                                                                                                                                                                                                                     |                                                |                 |   |   |   |             |    |      |    |    |    |
| (a)                                         | In relation to females and/or males, give any <b>three</b> methods of contraception.  |                                                                                                                                                                                                                     |                                                |                 |   |   |   |             |    |      |    |    |    |
|                                             | Chemical (or hormonal) / physical (or barrier) / surgical / natural (e.g. abstinence) |                                                                                                                                                                                                                     |                                                |                 |   |   |   |             |    |      |    |    |    |
| Any three - only one allowed from each type |                                                                                       |                                                                                                                                                                                                                     |                                                |                 |   |   |   |             |    | 3(3) |    |    |    |
| Q15 (a)                                     |                                                                                       | Number of correct responses                                                                                                                                                                                         |                                                |                 | 1 | 2 | 3 |             |    |      |    |    |    |
|                                             |                                                                                       | Mark                                                                                                                                                                                                                |                                                |                 | 3 | 6 | 9 |             |    |      |    |    |    |
| 9(3)                                        |                                                                                       |                                                                                                                                                                                                                     |                                                |                 |   |   |   |             |    |      |    |    |    |
| (b)                                         | (i)                                                                                   | In your answerbook, match <b>each</b> location ( <b>Fallopian tube; endometrium; ovary</b> ) in the female reproductive tract, to <b>each</b> of the events listed below:                                           |                                                |                 |   |   |   |             |    |      |    |    |    |
|                                             |                                                                                       | 1.                                                                                                                                                                                                                  | Ovulation:                                     | *Ovary          |   |   |   |             |    | 3    |    |    |    |
|                                             |                                                                                       | 2.                                                                                                                                                                                                                  | Fertilisation:                                 | *Fallopian tube |   |   |   |             |    | 3    |    |    |    |
|                                             |                                                                                       | 3.                                                                                                                                                                                                                  | Implantation:                                  | *Endometrium    |   |   |   |             |    | 3    |    |    |    |
|                                             | (ii)                                                                                  | Give <b>one</b> function of the placenta.                                                                                                                                                                           |                                                |                 |   |   |   |             |    |      |    |    |    |
|                                             |                                                                                       | Produce hormones <b>or</b> acts a protective barrier <b>or</b> allows transfer of nutrients <b>or</b> allows transfer of oxygen <b>or</b> allows transfer of waste products (of metabolism) <b>or</b> other correct |                                                |                 |   |   |   |             |    |      | 3  |    |    |
|                                             | (iii)                                                                                 | There are three stages to the birth process: <b>Labour; Birth; Afterbirth</b> . Match <b>each</b> stage named above to the following <b>three</b> descriptions:                                                     |                                                |                 |   |   |   |             |    |      |    |    |    |
|                                             |                                                                                       | 1:                                                                                                                                                                                                                  | The passage of the foetus out of the uterus.   |                 |   |   |   | *Birth      |    | 3    |    |    |    |
|                                             |                                                                                       | 2:                                                                                                                                                                                                                  | The passage of the placenta out of the uterus. |                 |   |   |   | *Afterbirth |    | 3    |    |    |    |
|                                             |                                                                                       | 3:                                                                                                                                                                                                                  | Rhythmical contractions of the uterus.         |                 |   |   |   | *Labour     |    | 3    |    |    |    |
|                                             | (iv)                                                                                  | Which <b>one</b> of the following hormones is responsible for milk production?<br><b>Prolactin; Insulin</b>                                                                                                         |                                                |                 |   |   |   |             |    |      |    |    |    |
|                                             |                                                                                       | *Prolactin                                                                                                                                                                                                          |                                                |                 |   |   |   |             |    |      | 3  |    |    |
|                                             | (v)                                                                                   | Give <b>one</b> biological benefit of breastfeeding.                                                                                                                                                                |                                                |                 |   |   |   |             |    |      |    |    |    |
|                                             |                                                                                       | Balanced nutrition <b>or</b> contains antibodies <b>or</b> sterile <b>or</b> bonding <b>or</b> other correct                                                                                                        |                                                |                 |   |   |   |             |    |      | 3  |    |    |
| Q15 (b) (i) – (v)                           |                                                                                       | Number of correct responses                                                                                                                                                                                         |                                                |                 | 1 | 2 | 3 | 4           | 5  | 6    | 7  | 8  | 9  |
|                                             |                                                                                       | Mark                                                                                                                                                                                                                |                                                |                 | 3 | 6 | 9 | 12          | 15 | 18   | 21 | 24 | 27 |

| Question 15 (continued) |                                                            |                                                                                          |                 |    |   |   |   |    |    |    |    |    |
|-------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------|----|---|---|---|----|----|----|----|----|
| 8(3)                    |                                                            |                                                                                          |                 |    |   |   |   |    |    |    |    |    |
| (c)                     | (i)                                                        | Match <b>each</b> of the parts labelled <b>A, B</b> and <b>C</b> to the following terms: |                 |    |   |   |   |    |    |    |    |    |
|                         |                                                            | 1.                                                                                       | Midpiece (neck) | *B |   |   |   |    |    |    | 3  |    |
|                         |                                                            | 2.                                                                                       | Head            | *C |   |   |   |    |    |    | 3  |    |
|                         |                                                            | 3.                                                                                       | Tail            | *A |   |   |   |    |    |    | 3  |    |
|                         | (ii)                                                       | Name the organ in the male reproductive system where sperm cells are produced.           |                 |    |   |   |   |    |    |    |    |    |
|                         |                                                            | *Testes                                                                                  |                 |    |   |   |   |    |    |    | 3  |    |
|                         | (iii)                                                      | Name the hormone responsible for sperm production.                                       |                 |    |   |   |   |    |    |    |    |    |
|                         |                                                            | Testosterone                                                                             |                 |    |   |   |   |    |    |    | 3  |    |
|                         | (iv)                                                       | What is meant by the term <i>infertility</i> ?                                           |                 |    |   |   |   |    |    |    |    |    |
|                         |                                                            | Inability to produce offspring                                                           |                 |    |   |   |   |    |    |    | 3  |    |
|                         | (v)                                                        | Give <b>one</b> cause of infertility in males.                                           |                 |    |   |   |   |    |    |    |    |    |
|                         | Hormonal <b>or</b> low sperm count <b>or</b> other correct |                                                                                          |                 |    |   |   |   |    |    | 3  |    |    |
| (vi)                    | What is meant by the term <i>in vitro</i> fertilisation?   |                                                                                          |                 |    |   |   |   |    |    |    |    |    |
|                         | Fusion of sperm and egg cell outside the body              |                                                                                          |                 |    |   |   |   |    |    | 3  |    |    |
| Q15 (c) (i) – (vi)      |                                                            | Number of correct responses                                                              |                 |    | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8  |
|                         |                                                            | Mark                                                                                     |                 |    | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 |

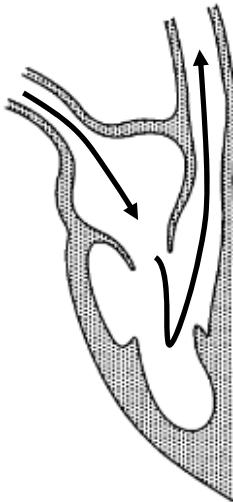


|                    |                                      |               |
|--------------------|--------------------------------------|---------------|
| <b>Question 16</b> | <b>Any two of (a), (b), (c), (d)</b> | <b>30, 30</b> |
|--------------------|--------------------------------------|---------------|

|                        |           |
|------------------------|-----------|
| <b>Question 16 (a)</b> | <b>30</b> |
|------------------------|-----------|

| 10(3)            |                                                                                                                      |                             |                                          |   |   |    |    |    |    |    |    |    |
|------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------|------------------------------------------|---|---|----|----|----|----|----|----|----|
| (i)              | Match <b>each</b> of the parts labelled <b>A, B</b> and <b>C</b> to the following terms:                             |                             |                                          |   |   |    |    |    |    |    |    |    |
|                  | 1.                                                                                                                   | Ligament                    | *A                                       |   |   |    |    |    |    | 3  |    |    |
|                  | 2.                                                                                                                   | Synovial fluid              | *C                                       |   |   |    |    |    |    | 3  |    |    |
|                  | 3.                                                                                                                   | Cartilage                   | *B                                       |   |   |    |    |    |    | 3  |    |    |
| (ii)             | Give <b>one</b> function of cartilage.                                                                               |                             |                                          |   |   |    |    |    |    |    |    |    |
|                  | Shock absorption <b>or</b> friction-free movement <b>or</b> other correct                                            |                             |                                          |   |   |    |    |    |    |    | 3  |    |
| (iii)            | Give an example of a location for <b>each</b> of the following types of joint:                                       |                             |                                          |   |   |    |    |    |    |    |    |    |
|                  | 1.                                                                                                                   | A synovial joint:           | Correct location given                   |   |   |    |    |    |    | 3  |    |    |
|                  | 2.                                                                                                                   | An immovable joint:         | Skull <b>or</b> other correct            |   |   |    |    |    |    | 3  |    |    |
|                  | 3.                                                                                                                   | A slightly movable joint:   | Vertebral column <b>or</b> named example |   |   |    |    |    |    | 3  |    |    |
| (iv)             | Which <b>one</b> of the following terms is used to describe these muscle pairs?<br><b>Antigen;      Antagonistic</b> |                             |                                          |   |   |    |    |    |    |    |    |    |
|                  | *Antagonistic                                                                                                        |                             |                                          |   |   |    |    |    |    |    | 3  |    |
| (v)              | Describe, using an example, how a muscle pair causes movement.                                                       |                             |                                          |   |   |    |    |    |    |    |    |    |
|                  | When one muscle contracts, the other relaxes                                                                         |                             |                                          |   |   |    |    |    |    |    | 3  |    |
|                  | At least one muscle named                                                                                            |                             |                                          |   |   |    |    |    |    |    | 3  |    |
|                  |                                                                                                                      |                             |                                          |   |   |    |    |    |    |    |    |    |
| Q16(a) (i) – (v) |                                                                                                                      | Number of correct responses | 1                                        | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|                  |                                                                                                                      | Mark                        | 3                                        | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |

| Question 16 (b)    |                                                                                                                   |                             |    | 30                  |   |   |    |    |    |    |    |    |    |
|--------------------|-------------------------------------------------------------------------------------------------------------------|-----------------------------|----|---------------------|---|---|----|----|----|----|----|----|----|
| 10(3)              |                                                                                                                   |                             |    |                     |   |   |    |    |    |    |    |    |    |
| (i)                | In your answerbook, match the labels 1, 2, 3 and 4 with the following terms:                                      |                             |    |                     |   |   |    |    |    |    |    |    |    |
|                    | 1.                                                                                                                | Hair                        | *Q | 3                   |   |   |    |    |    |    |    |    |    |
|                    | 2.                                                                                                                | Sebaceous gland             | *S | 3                   |   |   |    |    |    |    |    |    |    |
|                    | 3.                                                                                                                | Epidermis                   | *P | 3                   |   |   |    |    |    |    |    |    |    |
|                    | 4.                                                                                                                | Sweat duct                  | *R | 3                   |   |   |    |    |    |    |    |    |    |
| (ii)               | Give a function of the skin other than its role in the general defence system.                                    |                             |    |                     |   |   |    |    |    |    |    |    |    |
|                    | Excretion <b>or</b> vitamin D production <b>or</b> stores fat <b>or</b> controls body temperature                 |                             |    | 3                   |   |   |    |    |    |    |    |    |    |
| (iii)              | What is a <i>pathogen</i> ?                                                                                       |                             |    |                     |   |   |    |    |    |    |    |    |    |
|                    | Disease-causing organism                                                                                          |                             |    | 3                   |   |   |    |    |    |    |    |    |    |
| (iv)               | If a pathogen enters the body, give <b>one</b> way the <b>specific</b> defence system can eliminate the pathogen. |                             |    |                     |   |   |    |    |    |    |    |    |    |
|                    | Lymphocytes produce antibodies (against pathogen)                                                                 |                             |    | 3                   |   |   |    |    |    |    |    |    |    |
| (v)                | Which type of immunity (active <b>or</b> passive) provides long term protection?                                  |                             |    |                     |   |   |    |    |    |    |    |    |    |
|                    | *Active                                                                                                           |                             |    | 3                   |   |   |    |    |    |    |    |    |    |
| (vi)               | Name <b>two</b> organs that are part of the specific defence system (immune system).                              |                             |    |                     |   |   |    |    |    |    |    |    |    |
|                    | Spleen / thymus / tonsils / adenoids / lymph nodes                                                                |                             |    | <b>Any two</b> 2(3) |   |   |    |    |    |    |    |    |    |
| Q16 (b) (i) – (vi) |                                                                                                                   | Number of correct responses |    | 1                   | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|                    |                                                                                                                   | Mark                        |    | 3                   | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |

| Question 16 (c)    |                                                                                                                                                                                                         |                             |    |   |   |   |    |    |    | 30 |                            |    |    |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----|---|---|---|----|----|----|----|----------------------------|----|----|
| 10(3)              |                                                                                                                                                                                                         |                             |    |   |   |   |    |    |    |    |                            |    |    |
| (i)                | Match the letters <b>A</b> , <b>B</b> and <b>C</b> from the diagram to the following structures:                                                                                                        |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    | 1.                                                                                                                                                                                                      | Tricuspid valve             | *B |   |   |   |    |    |    |    | 3                          |    |    |
|                    | 2.                                                                                                                                                                                                      | Ventricle                   | *C |   |   |   |    |    |    |    | 3                          |    |    |
|                    | 3.                                                                                                                                                                                                      | Vena cava                   | *A |   |   |   |    |    |    |    | 3                          |    |    |
| (ii)               | Copy the diagram, without the labels, into your answerbook and draw at least <b>two</b> arrows to indicate the direction of blood flow through the right-hand side of the heart.                        |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    |                                                                                                                       |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    | Arrow 1 showing correct direction                                                                                                                                                                       |                             |    |   |   |   |    |    |    |    | 3                          |    |    |
|                    | Arrow 2 showing correct direction                                                                                                                                                                       |                             |    |   |   |   |    |    |    |    | 3                          |    |    |
| (iii)              | To which organ is the blood from part <b>C</b> transported to in order to gain oxygen?                                                                                                                  |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    | *Lungs                                                                                                                                                                                                  |                             |    |   |   |   |    |    |    |    | 3                          |    |    |
| (iv)               | Name the molecule found in red blood cells which is responsible for carrying oxygen round the body.                                                                                                     |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    | *Haemoglobin                                                                                                                                                                                            |                             |    |   |   |   |    |    |    |    | 3                          |    |    |
| (v)                | State <b>two</b> ways in which the structure of arteries and veins differ.                                                                                                                              |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    | Arteries have thick walls or veins have thin walls / arteries have no valves (along their lengths) or veins have valves (along their lengths) / arteries have a small lumen or veins have a large lumen |                             |    |   |   |   |    |    |    |    | Any two 2(3)               |    |    |
| (vi)               | Briefly describe the effect of <b>one</b> of the following factors on the human circulatory system: <b>smoking or diet or exercise.</b>                                                                 |                             |    |   |   |   |    |    |    |    |                            |    |    |
|                    | Any <b>one</b> correct effect                                                                                                                                                                           |                             |    |   |   |   |    |    |    |    | Effect must match factor 3 |    |    |
| Q16 (c) (i) – (vi) |                                                                                                                                                                                                         | Number of correct responses |    | 1 | 2 | 3 | 4  | 5  | 6  | 7  | 8                          | 9  | 10 |
|                    |                                                                                                                                                                                                         | Mark                        |    | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24                         | 27 | 30 |

| Question 16 (d)      |                                                                                                                                                     |                             |   |   |    |    |    |    |    |    | 30 |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---|---|----|----|----|----|----|----|----|
| 10(3)                |                                                                                                                                                     |                             |   |   |    |    |    |    |    |    |    |
| (i)                  | Based on information provided in the diagrams above, match the terms <i>phloem</i> and <i>xylem</i> to the tissues labelled <b>A</b> and <b>B</b> . |                             |   |   |    |    |    |    |    |    |    |
|                      | <b>A:</b> *Xylem                                                                                                                                    |                             |   |   |    |    |    |    |    |    | 3  |
|                      | <b>B:</b> *Phloem                                                                                                                                   |                             |   |   |    |    |    |    |    |    | 3  |
| (ii)                 | Which tissue, <b>A</b> or <b>B</b> , transports water and mineral?                                                                                  |                             |   |   |    |    |    |    |    |    |    |
|                      | * <b>A</b> or xylem                                                                                                                                 |                             |   |   |    |    |    |    |    |    | 3  |
| (iii)                | Which tissue, <b>A</b> or <b>B</b> , transports food?                                                                                               |                             |   |   |    |    |    |    |    |    |    |
|                      | * <b>B</b> or phloem                                                                                                                                |                             |   |   |    |    |    |    |    |    | 3  |
| (iv)                 | In which of the tissues, <b>A</b> or <b>B</b> would you find companion cells?                                                                       |                             |   |   |    |    |    |    |    |    |    |
|                      | * <b>B</b>                                                                                                                                          |                             |   |   |    |    |    |    |    |    | 3  |
| (v)                  | <b>Copy the diagram showing tissue A into your answerbook and</b> draw an arrow to indicate the direction of flow.                                  |                             |   |   |    |    |    |    |    |    |    |
|                      | Arrow point upwards                                                                                                                                 |                             |   |   |    |    |    |    |    |    | 3  |
| (vi)                 | Name any <b>one</b> process that causes the movement of water through a plant.                                                                      |                             |   |   |    |    |    |    |    |    |    |
|                      | Root pressure <b>or</b> transpiration (allow osmosis)                                                                                               |                             |   |   |    |    |    |    |    |    | 3  |
| (vii)                | Draw a <b>longitudinal</b> section of a stem <b>and</b> label the location of vascular tissue.                                                      |                             |   |   |    |    |    |    |    |    |    |
|                      | Drawing                                                                                                                                             |                             |   |   |    |    |    |    |    |    | 3  |
|                      | Vascular tissue labelled                                                                                                                            |                             |   |   |    |    |    |    |    |    | 3  |
| (viii)               | Name the structures found in the <b>stem</b> of a plant that allows gas exchange.                                                                   |                             |   |   |    |    |    |    |    |    |    |
|                      | *Lenticels                                                                                                                                          |                             |   |   |    |    |    |    |    |    | 3  |
| Q16 (d) (i) – (viii) |                                                                                                                                                     | Number of correct responses |   |   |    |    |    |    |    |    |    |
|                      |                                                                                                                                                     | Mark                        |   |   |    |    |    |    |    |    |    |
|                      |                                                                                                                                                     | 1                           | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|                      |                                                                                                                                                     | 3                           | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |

|                    |                                                        |                                                                                                                                       |  |  |  |    |   |                                   |    |    |    |        |    |    |    |
|--------------------|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----|---|-----------------------------------|----|----|----|--------|----|----|----|
| Question 17        |                                                        | Any two of (a), (b), (c), (d)                                                                                                         |  |  |  |    |   |                                   |    |    |    | 30, 30 |    |    |    |
| Question 17 (a)    |                                                        |                                                                                                                                       |  |  |  |    |   |                                   |    |    |    |        |    | 30 |    |
| 10(3)              |                                                        |                                                                                                                                       |  |  |  |    |   |                                   |    |    |    |        |    |    |    |
| (i)                |                                                        | In your answerbook, match the labels <b>A, B, C and D</b> with the parts listed below:                                                |  |  |  |    |   |                                   |    |    |    |        |    |    |    |
|                    | 1.                                                     | Pinna                                                                                                                                 |  |  |  | *A |   |                                   |    |    |    | 3      |    |    |    |
|                    | 2.                                                     | Eustachian tube                                                                                                                       |  |  |  | *D |   |                                   |    |    |    | 3      |    |    |    |
|                    | 3.                                                     | Semi-circular canals                                                                                                                  |  |  |  | *C |   |                                   |    |    |    | 3      |    |    |    |
|                    | 4.                                                     | Eardrum                                                                                                                               |  |  |  | *B |   |                                   |    |    |    | 3      |    |    |    |
| (ii)               |                                                        | In your answerbook, match <b>three</b> of the parts listed above to their functions below:                                            |  |  |  |    |   |                                   |    |    |    |        |    |    |    |
|                    | 1.                                                     | Balance                                                                                                                               |  |  |  |    |   | *C <b>or</b> semi-circular canals |    |    |    |        |    | 3  |    |
|                    | 2.                                                     | Equalisation of air pressure                                                                                                          |  |  |  |    |   | *D <b>or</b> Eustachian tube      |    |    |    |        |    | 3  |    |
|                    | 3.                                                     | Transfer of sound vibrations to the middle ear                                                                                        |  |  |  |    |   | *B <b>or</b> eardrum              |    |    |    |        |    | 3  |    |
| (iii)              |                                                        | Which <b>one</b> of the following nerves carries impulses from the ear to the brain?<br><b>Optic nerve or Auditory nerve.</b>         |  |  |  |    |   |                                   |    |    |    |        |    |    |    |
|                    | *Auditory nerve                                        |                                                                                                                                       |  |  |  |    |   |                                   |    |    |    |        |    | 3  |    |
| (iv)               |                                                        | Name <b>one</b> disorder of the ear <b>or</b> the eye <b>and</b> give <b>one</b> possible treatment for the<br><b>named</b> disorder. |  |  |  |    |   |                                   |    |    |    |        |    |    |    |
|                    | Correctly named disorder of eye or ear                 |                                                                                                                                       |  |  |  |    |   |                                   |    |    |    |        |    | 3  |    |
|                    | Correctly given <b>and</b> matching possible treatment |                                                                                                                                       |  |  |  |    |   |                                   |    |    |    |        |    | 3  |    |
| Q17 (a) (i) – (iv) |                                                        | Number of correct responses                                                                                                           |  |  |  | 1  | 2 | 3                                 | 4  | 5  | 6  | 7      | 8  | 9  | 10 |
|                    |                                                        | Mark                                                                                                                                  |  |  |  | 3  | 6 | 9                                 | 12 | 15 | 18 | 21     | 24 | 27 | 30 |

| Question 17 (b)                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                   |                                 |   |   |    |    |    |    |    |    | 30            |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---|---|----|----|----|----|----|----|---------------|-------------------|-----------------------------|------------|----------------|--------|----------|-------------|----------------------------|---------|------------|---------------------------------|------------------|------|---|---|---|----|----|----|----|----|----|----|
| 10(3)                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                   |                                 |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| (i)                                                                                                                                                                                                                                                                                                                                      | Which type of gland ( <b>exocrine</b> or <b>endocrine</b> ) is responsible for secreting hormones?                                                                                                                                                                                                                                |                                 |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                          | *Endocrine                                                                                                                                                                                                                                                                                                                        |                                 |   |   |    |    |    |    |    |    | 3             |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| (ii)                                                                                                                                                                                                                                                                                                                                     | Explain in detail the term <i>hormone</i> .                                                                                                                                                                                                                                                                                       |                                 |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                          | A chemical / messenger (or described) / secreted into the blood / travels in blood / has an effect on a target tissue or organ (or described)<br><b>Any two</b>                                                                                                                                                                   |                                 |   |   |    |    |    |    |    |    | 2(3)          |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| (iii)                                                                                                                                                                                                                                                                                                                                    | Copy the table below <b>into your answerbook and</b> complete it using the words in the list. Some boxes have been completed as examples.<br>List: <b>Thyroxine; Adrenal; Pituitary; Adrenaline.</b>                                                                                                                              |                                 |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                          | <table><tr><th>Name of gland</th><th>Hormone</th><th>Function of hormone</th></tr><tr><td>*Pituitary</td><td>Growth hormone</td><td>Growth</td></tr><tr><td>*Adrenal</td><td>*Adrenaline</td><td>‘Fight or flight’ response</td></tr><tr><td>Thyroid</td><td>*Thyroxine</td><td>Controls the rate of metabolism</td></tr></table> |                                 |   |   |    |    |    |    |    |    | Name of gland | Hormone           | Function of hormone         | *Pituitary | Growth hormone | Growth | *Adrenal | *Adrenaline | ‘Fight or flight’ response | Thyroid | *Thyroxine | Controls the rate of metabolism | 3<br>3<br>3<br>3 |      |   |   |   |    |    |    |    |    |    |    |
| Name of gland                                                                                                                                                                                                                                                                                                                            | Hormone                                                                                                                                                                                                                                                                                                                           | Function of hormone             |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| *Pituitary                                                                                                                                                                                                                                                                                                                               | Growth hormone                                                                                                                                                                                                                                                                                                                    | Growth                          |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| *Adrenal                                                                                                                                                                                                                                                                                                                                 | *Adrenaline                                                                                                                                                                                                                                                                                                                       | ‘Fight or flight’ response      |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| Thyroid                                                                                                                                                                                                                                                                                                                                  | *Thyroxine                                                                                                                                                                                                                                                                                                                        | Controls the rate of metabolism |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| (iv)                                                                                                                                                                                                                                                                                                                                     | State <b>two</b> ways in which hormone action differs from nerve action.                                                                                                                                                                                                                                                          |                                 |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                          | Hormone action is slow <b>or</b> nerve action is fast /<br>Hormonal action is by movement of chemicals through the blood <b>or</b> nerve action is by movement of ions through neurons /<br>Hormonal action is generally widespread (or described) <b>or</b> nerve action is generally localised (or described)<br><b>Any two</b> |                                 |   |   |    |    |    |    |    |    | 2(3)          |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| (v)                                                                                                                                                                                                                                                                                                                                      | Give <b>one</b> example of the use of hormone supplements.                                                                                                                                                                                                                                                                        |                                 |   |   |    |    |    |    |    |    |               |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                          | Hormonal injection (therapies) <b>or</b> other correct                                                                                                                                                                                                                                                                            |                                 |   |   |    |    |    |    |    |    | 3             |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
| <table><tr><td rowspan="2">Q17 (b) (i) – (v)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td></tr></table> |                                                                                                                                                                                                                                                                                                                                   |                                 |   |   |    |    |    |    |    |    |               | Q17 (b) (i) – (v) | Number of correct responses | 1          | 2              | 3      | 4        | 5           | 6                          | 7       | 8          | 9                               | 10               | Mark | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| Q17 (b) (i) – (v)                                                                                                                                                                                                                                                                                                                        | Number of correct responses                                                                                                                                                                                                                                                                                                       | 1                               | 2 | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10            |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                          | Mark                                                                                                                                                                                                                                                                                                                              | 3                               | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30            |                   |                             |            |                |        |          |             |                            |         |            |                                 |                  |      |   |   |   |    |    |    |    |    |    |    |

| Question 17 (c)    |                                                                                  |                             |    |  |  |  |  |  |  |  |   |   | 30   |    |    |    |    |    |    |    |
|--------------------|----------------------------------------------------------------------------------|-----------------------------|----|--|--|--|--|--|--|--|---|---|------|----|----|----|----|----|----|----|
| 10(3)              |                                                                                  |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
| (i)                | In your answer book, match the letters X, Y and Z to the following flower parts: |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
|                    | 1.                                                                               | Ovary                       | *Z |  |  |  |  |  |  |  |   | 3 |      |    |    |    |    |    |    |    |
|                    | 2.                                                                               | Filament                    | *Y |  |  |  |  |  |  |  |   | 3 |      |    |    |    |    |    |    |    |
|                    | 3.                                                                               | Stigma                      | *X |  |  |  |  |  |  |  |   | 3 |      |    |    |    |    |    |    |    |
| (ii)               | Does the pollen grain contain the female <b>or</b> male gamete?                  |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
|                    | *Male                                                                            |                             |    |  |  |  |  |  |  |  |   |   | 3    |    |    |    |    |    |    |    |
| (iii)              | Explain the term <i>pollination</i> .                                            |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
|                    | Transfer of pollen from the anther to the stigma.                                |                             |    |  |  |  |  |  |  |  |   |   | 3    |    |    |    |    |    |    |    |
| (iv)               | Name <b>two</b> methods by which plants can be pollinated.                       |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
|                    | Self / insect (or animal) / wind / water <b>Any two</b>                          |                             |    |  |  |  |  |  |  |  |   |   | 2(3) |    |    |    |    |    |    |    |
| (v)                | Which part of the flower is responsible for seed production?                     |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
|                    | *Ovary <b>or</b> Z (accept ovule)                                                |                             |    |  |  |  |  |  |  |  |   |   | 3    |    |    |    |    |    |    |    |
| (vi)               | Give any <b>two</b> ways in which seeds can be dispersed.                        |                             |    |  |  |  |  |  |  |  |   |   |      |    |    |    |    |    |    |    |
|                    | Wind / water / animal / self <b>Any two</b>                                      |                             |    |  |  |  |  |  |  |  |   |   | 2(3) |    |    |    |    |    |    |    |
| Q17 (c) (i) – (vi) |                                                                                  | Number of correct responses |    |  |  |  |  |  |  |  | 1 | 2 | 3    | 4  | 5  | 6  | 7  | 8  | 9  | 10 |
|                    |                                                                                  | Mark                        |    |  |  |  |  |  |  |  | 3 | 6 | 9    | 12 | 15 | 18 | 21 | 24 | 27 | 30 |

| Question 17 (d)                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                          |                                                           |                |   |    |    |    |    |    |    |    | 30       |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|----------------|---|----|----|----|----|----|----|----|----------|--------------------|-----------------------------|----------|-----------------|---------|--------|---|---|---|---|---|----|------|---|---|---|----|----|----|----|----|----|----|
| 10(3)                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                          |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| (i)                                                                                                                                                                                                                                                                                                                                       | Match diagram <b>A</b> and diagram <b>B</b> to the following named organisms:                                                                                                                                                                            |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | 1.                                                                                                                                                                                                                                                       | Yeast                                                     | *B             |   |    |    |    |    |    |    | 3  |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | 2.                                                                                                                                                                                                                                                       | <i>Rhizopus</i> (bread mould)                             | *A             |   |    |    |    |    |    |    | 3  |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| (ii)                                                                                                                                                                                                                                                                                                                                      | To which <b>one</b> of the following kingdoms do <b>both</b> of these organisms belong?<br><b>Monera; Protista; Fungi.</b>                                                                                                                               |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | *Fungi                                                                                                                                                                                                                                                   |                                                           |                |   |    |    |    |    |    |    |    | 3        |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| (iii)                                                                                                                                                                                                                                                                                                                                     | Copy the following table into your answerbook and complete it using the following terms: <b>spores; budding</b>                                                                                                                                          |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | <table><tr><th>Organism</th><th>Reproduces by....</th></tr><tr><td>Yeast</td><td>*Budding</td></tr><tr><td><i>Rhizopus</i></td><td>*Spores</td></tr></table>                                                                                             |                                                           |                |   |    |    |    |    |    |    |    | Organism | Reproduces by....  | Yeast                       | *Budding | <i>Rhizopus</i> | *Spores | 3<br>3 |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| Organism                                                                                                                                                                                                                                                                                                                                  | Reproduces by....                                                                                                                                                                                                                                        |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| Yeast                                                                                                                                                                                                                                                                                                                                     | *Budding                                                                                                                                                                                                                                                 |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| <i>Rhizopus</i>                                                                                                                                                                                                                                                                                                                           | *Spores                                                                                                                                                                                                                                                  |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| (iv)                                                                                                                                                                                                                                                                                                                                      | Match the terms <i>heterotrophic</i> and <i>autotrophic</i> to the following descriptions:                                                                                                                                                               |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | 1.                                                                                                                                                                                                                                                       | An organism that makes its own food.                      | *Autotrophic   |   |    |    |    |    |    |    | 3  |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | 2.                                                                                                                                                                                                                                                       | An organism that obtains its food from other organisms.   | *Heterotrophic |   |    |    |    |    |    |    | 3  |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| (v)                                                                                                                                                                                                                                                                                                                                       | Which <b>one</b> of the following sequences of terms associated with sexual reproduction in <i>Rhizopus</i> is in the correct order?<br><b>A: Progametangium → gametangium → fertilisation</b><br><b>B: Gametangium → progametangium → fertilisation</b> |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | *A or Progametangium → gametangium → fertilisation                                                                                                                                                                                                       |                                                           |                |   |    |    |    |    |    |    |    | 3        |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| (vi)                                                                                                                                                                                                                                                                                                                                      | Match the terms, <i>asepsis</i> and <i>sterility</i> , to the following descriptions:                                                                                                                                                                    |                                                           |                |   |    |    |    |    |    |    |    |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | 1.                                                                                                                                                                                                                                                       | The technique that ensures absence of all microorganisms. | *Sterility     |   |    |    |    |    |    |    | 3  |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | 2.                                                                                                                                                                                                                                                       | The technique that ensures absence of pathogens.          | *Asepsis       |   |    |    |    |    |    |    | 3  |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
| <table><tr><td rowspan="2">Q17 (d) (i) – (vi)</td><td>Number of correct responses</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Mark</td><td>3</td><td>6</td><td>9</td><td>12</td><td>15</td><td>18</td><td>21</td><td>24</td><td>27</td><td>30</td></tr></table> |                                                                                                                                                                                                                                                          |                                                           |                |   |    |    |    |    |    |    |    |          | Q17 (d) (i) – (vi) | Number of correct responses | 1        | 2               | 3       | 4      | 5 | 6 | 7 | 8 | 9 | 10 | Mark | 3 | 6 | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |
| Q17 (d) (i) – (vi)                                                                                                                                                                                                                                                                                                                        | Number of correct responses                                                                                                                                                                                                                              | 1                                                         | 2              | 3 | 4  | 5  | 6  | 7  | 8  | 9  | 10 |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |
|                                                                                                                                                                                                                                                                                                                                           | Mark                                                                                                                                                                                                                                                     | 3                                                         | 6              | 9 | 12 | 15 | 18 | 21 | 24 | 27 | 30 |          |                    |                             |          |                 |         |        |   |   |   |   |   |    |      |   |   |   |    |    |    |    |    |    |    |









