



KWAZULU-NATAL PROVINCE

EDUCATION
REPUBLIC OF SOUTH AFRICA



**NATIONAL
SENIOR CERTIFICATE**

GRADE 10

LIFE SCIENCES

JUNE 2022

COMMON TEST

Stannmorephysics.com

MARKS : 120

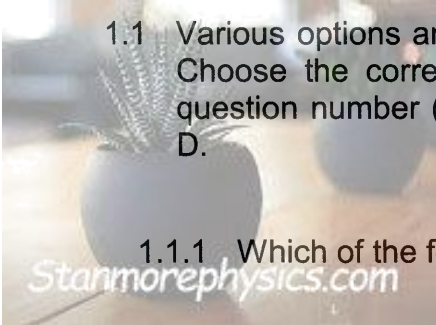
TIME: 2 Hours

This question paper consist of 12 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. Answer ALL the questions.
2. Write ALL the answers in the ANSWER BOOK.
3. Start the answers to each question at the top of a NEW page.
4. Number the answers correctly according to the numbering system used in this question paper.
5. Present your answers according to the instructions of each question.
6. Do ALL drawings in pencil and label them in blue or black ink.
7. Draw diagrams, tables or flow charts only when asked to do so.
8. The diagrams in this question paper are NOT necessarily drawn to scale.
9. Do NOT use graph paper.
10. You may use a non-programmable calculator, protractor and a compass.
11. Write neatly and legibly.

SECTION A**QUESTION 1**

1.1 Various options are provided as possible answers to the following questions. Choose the correct answer and write only the letter (A to D) next to the question number (1.1.1 to 1.1.7) in your ANSWER BOOK, for example 1.1.4 D.

1.1.1 Which of the following parts forms an axial skeleton?

- A Arms, legs and vertebral column
- B Skull, rib cage and sternum
- C Lower limbs, skull, pelvic girdle
- D Skull, vertebral column, ribs and sternum

1.1.2 Identify the tissue that covers the surface of the plant

- A Xylem
- B Epidermis
- C Phloem
- D Collenchyma

1.1.3 Which of the following cells makes up a xylem tissue?

- A Xylem vessels and tracheids
- B Sieve tubes and companion cells
- C Tracheids and sieve tubes
- D Companion cells and xylem vessels

1.1.4 Which of the following is a function of a pelvic girdle?

- A Connect bone to bone
- B Attaches arms
- C Joins bone to muscles
- D It attaches legs to the pelvic

1.1.5 Which of the following is the site of protein synthesis

- A Golgi body
- B Cell wall
- C Ribosomes
- D Plasma membrane



1.1.6 The similarity between sclerenchyma and collenchyma tissue is that...

- A They are both packaging tissues
- B They both contain flexible fibres
- C They both provide support to the plant
- D They both manufacture food

1.1.7 What is the magnification of the eye piece if the total magnification is 40x and the objective lens is 10x

- A 4x
- B 40x
- C 15x
- D 2x

2x7 (14)

1.2 Give the correct **biological term** for each of the following descriptions. Write only the term next to the question number (1.2.1 to 1.2.9) in your ANSWER BOOK

- 1.2.1 An organic compound made up of three fatty acids and one glycerol
- 1.2.2 The bones that protects the spinal cord
- 1.2.3 The knob of microscope that is used for final and clear focus of the object
- 1.2.4 Movement of molecules from a region of high concentration to lower concentration
- 1.2.5 The tissue that line kidney tubes and some glands
- 1.2.6 The tissue transport food from the leaves to all parts of the body
- 1.2.7 Membrane that surround a vacuole
- 1.2.8 Bones that surround and protect of the brain
- 1.2.9 The Monomers of proteins

1x9

(9)

1.3 Indicate whether each of the statements in COLUMN I applies to **A ONLY, B ONLY, BOTH A AND B** or **NONE** of the items in COLUMN II. Write **A only, B only, both A and B**, or **none** next to the question number (1.3.1 to 1.3.4) in the ANSWER BOOK.

COLUMN I	COLUMN II
1.3.1 The tissue that serves as a storage tissue	A: Collenchyma B: Sclerenchyma
1.3.2 Connective tissue made up of collagen fibres	A: Fibrous Connective tissue B: Loose connective tissue
1.3.3 Separates xylem from phloem	A: Pith B: Cambium
1.3.4 Opening at the base of the skull	A: Foramen magnum B: Jaws

2x4(8)

1.4 The table below shows the results of different food test.

NUTRIENT	TEST MATERIAL	PRESENCE OF NUTRIENTS
T	Iodine solution	Blue-black
Glucose	U	V
W	Ethanol	White

1.4.1 Which nutrient was tested at:

- (a) **T** (1)
- (b) **W** (1)

1.4.2 Give ONE example of a monosaccharide from the table above (1)

1.4.3 State TWO functions of monosaccharide mentioned in QUESTION 1.4.2 (2)

1.4.4 What colour change is expected at **V** for positive test (1)

1.4.5 Name the chemical reagent at **U** (1)

1.4.6 What would be the colour change if **T** tested negative (1)

1.4.7 State the nutrient which requires heat when tested (1)

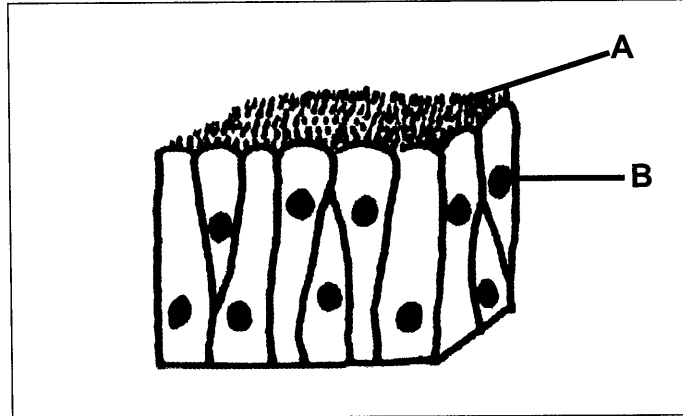
TOTAL SECTION A: (9)
(40)



SECTION B

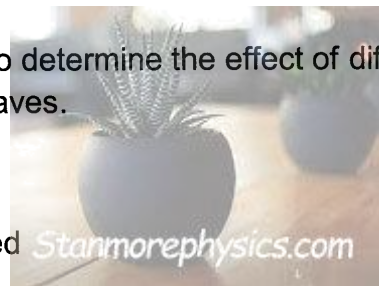
QUESTION 2

2.1 The diagram below shows an animal tissue



- 2.1.1 Identify the tissue above (1)
 - 2.1.2 Identify part **B** (1)
 - 2.1.3 Give only the LETTER of the part that traps the dust in the above tissue (1)
 - 2.1.4 Explain TWO ways in which the tissue mentioned in QUESTION 2.1.1 is structurally suited to perform its function (4)
 - 2.2 Explain THREE adaptations of xylem tissue for its function (7)
- (6)**
[13]

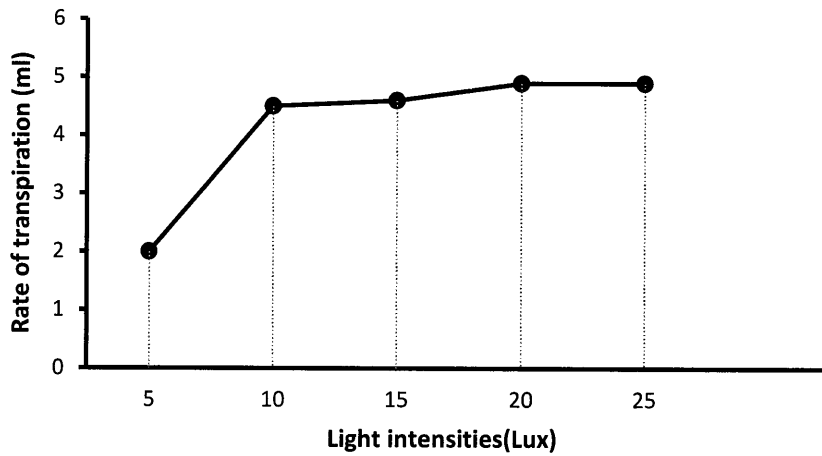
2.3 Grade 10 learners conducted an investigation to determine the effect of different light intensities on the rate of transpiration in leaves.



The following procedure was followed:

- 2 leafy shoot of the same plant were used
- The leafy shoots were of the same age
- The leafy shoots were then labelled leafy shoot A and leafy shoot B
- Leafy shoot A was exposed to different light intensities
- Leafy shoot B was placed in a dark area
- All others factors affecting transpiration rate were kept constant
- Potometer was used to measure the rate of transpiration in both groups
- The results of the investigation were recorded in every hour for each group

The results for leafy shoot A are shown in the graph below



2.3.1 Identify:

(a) Dependent variable (1)

(b) Independent variable (1)

2.3.2 State the effect of increasing the light intensity on transpiration rate from 0 to 5 (1)

2.3.3 Explain why an increase in light intensity above 10 does not increase the rate of transpiration (2)

2.3.4 List TWO ways in which learners could increase the reliability of the investigation (2)

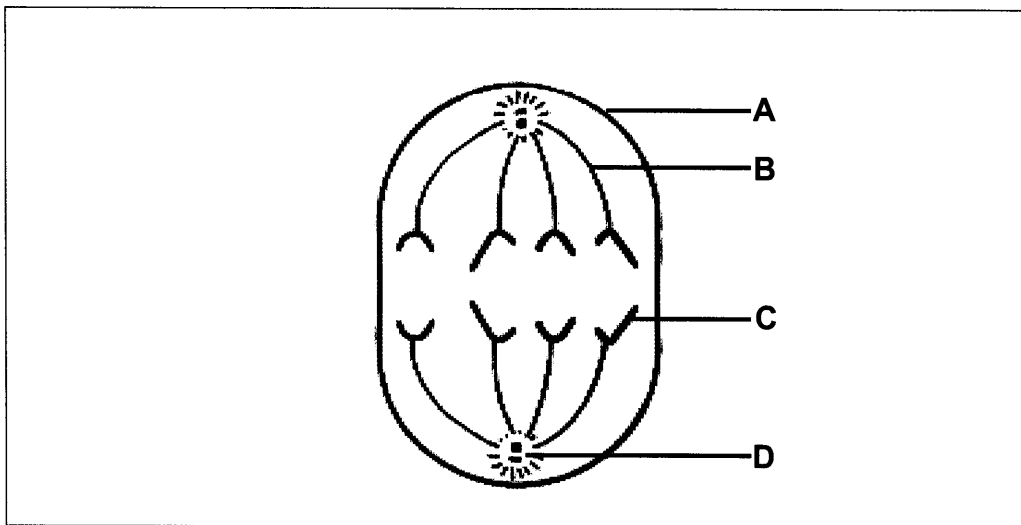
2.3.5 List TWO factors affecting the rate of transpiration other than the one that was investigated (2)

2.3.6 Explain why group B was included in the investigation (2)

2.3.7 State the conclusion for the above investigation (2)
(13)



2.4 The diagram below shows a phase of mitosis.



2.4.1 Identify the phase shown in the diagram above (1)

2.4.2 Give TWO visible reason for your answer (2)

2.4.3 Identify part:

(a) **A** (1)

(b) **B** (1)

2.4.4 State the LETTER and the NAME of the part that is not present in a plant cell (2)

2.4.5 Name and describe the events of the phase that appears before the one shown in the diagram above (4)

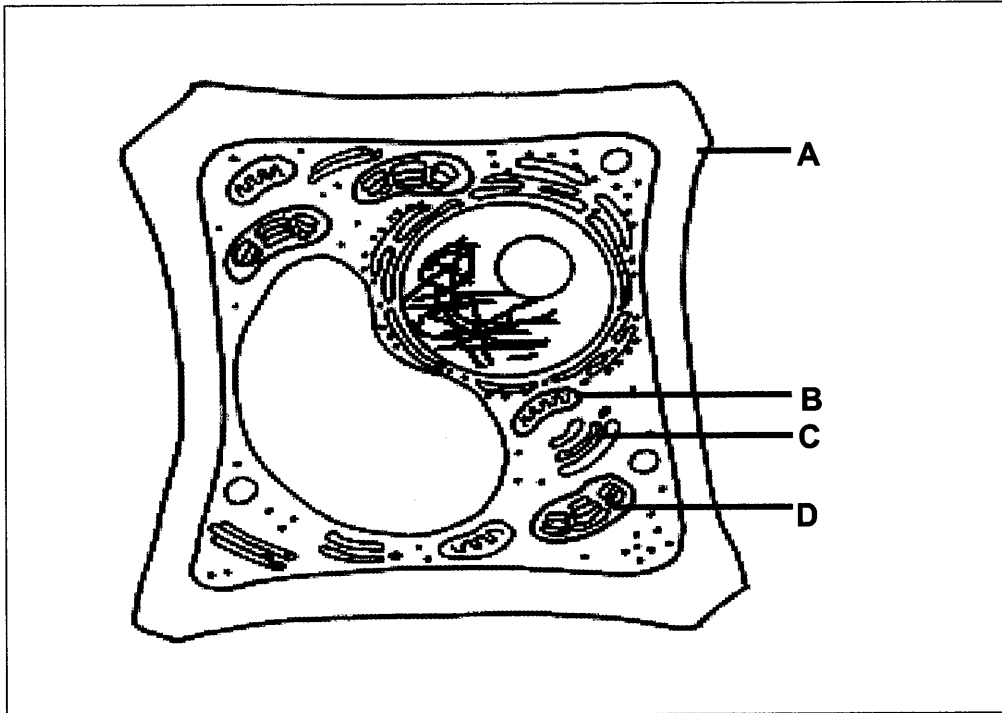
2.4.6 Give THREE biological importance of mitosis (3)

(14)

TOTAL QUESTION 2 [40]

QUESTION 3

3.1 The diagram below shows a part of a cell .



3.1.1 Identify organelle:

(a) **C**

(b) **D**



(1)

(1)

3.1.2 Is the above cell a plant cell or animal cell? Give **THREE** visible reasons for your answer

(4)

3.1.3 State **THREE** functions of part **A**

(3)

3.1.4 Give the **LETTER** of the part that need to be in great numbers in a muscle tissue. Explain your answer.

(3)

3.1.5 Part **D** contains a pigment which essential for photosynthesis taking place in plants.

Name the pigment and explain its role during photosynthesis

(3)

(15)

3.2 The table below shows the percentage of blood that passes through various organs in the body per minute



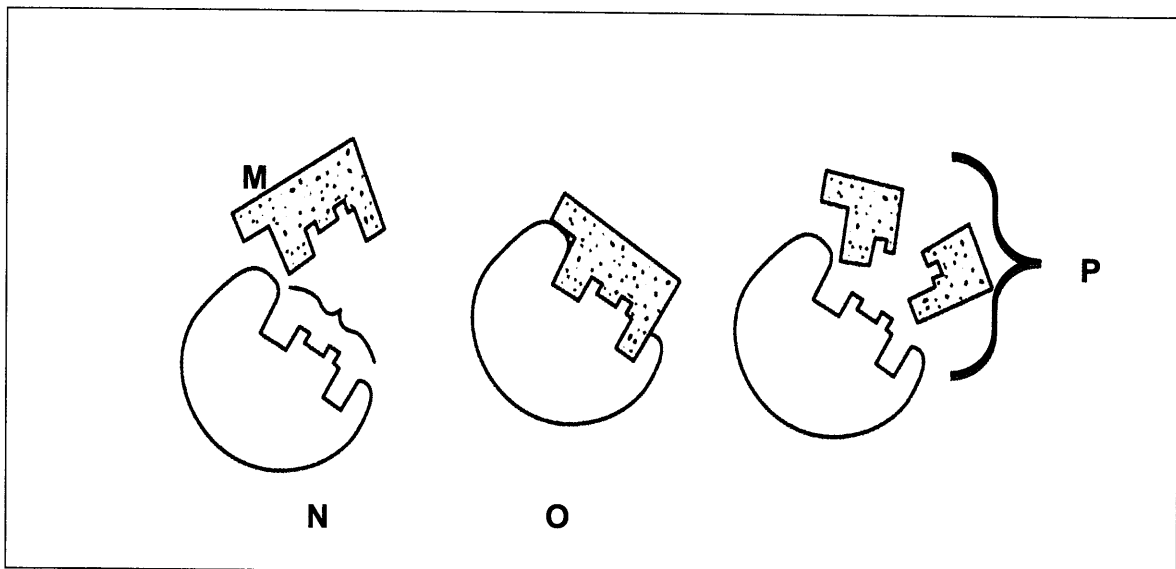
ORGANS	Amount of blood flow (%)
Liver	25
Brain	15
Small intestines	15
Kidneys	20

3.2.1 Draw a bar graph to represent the information shown in the table above (6)

3.2.2 Calculate the amount of blood that flows to other organs other than the one's mentioned in the table. Show ALL your workings (3)

3.3 Tabulate TWO structural differences between an artery and vein (9)
(5)
(14)

3.4 The diagram below shows a certain organic compound



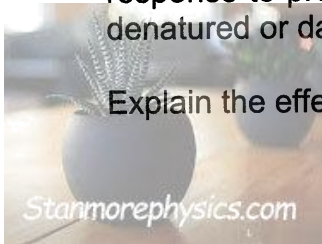
- 3.4.1 Give labels for:
- (a) **M** (1)
 - (b) **O** (1)
 - (c) **P** (1)

3.4.2 State the property of enzyme illustrated above (1)

3.4.3 List TWO properties of enzymes other than the one mentioned in QUESTION 3.4.2 (2)

3.4.4 Explain why part **P** has broken (1)

3.4.5 Hyperthermia is a condition where a body becomes overheated in response to prolonged hot, humid weather and can result to part **N** being denatured or damaged.



Explain the effects of part **N** in human body if it becomes denatured.

(4)

TOTAL QUESTION 3 (11)

TOTAL SECTION B (40)

[80]

GRAND TOTAL

[120]



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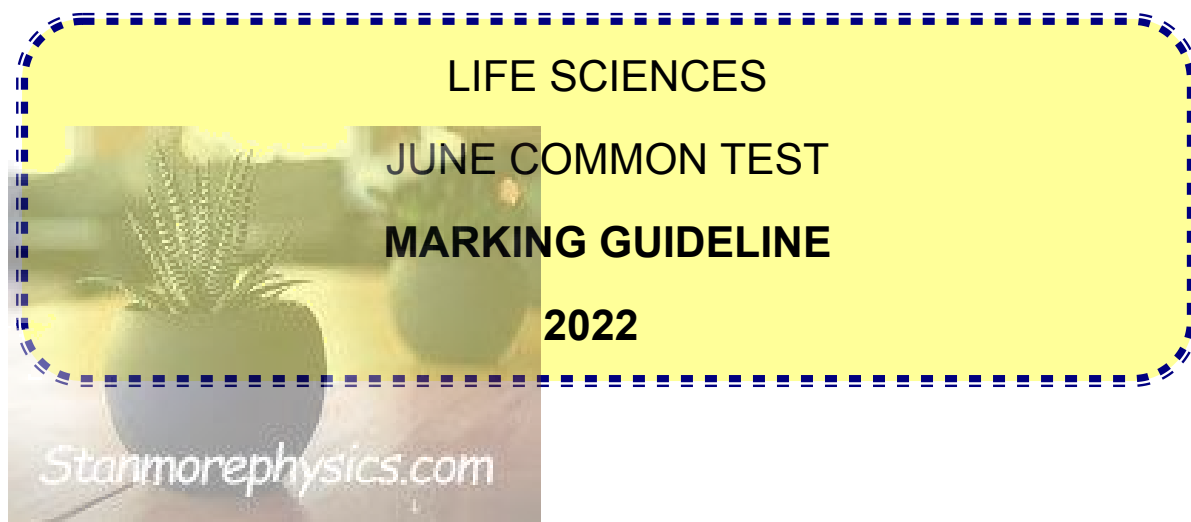
GRADE 10

LIFE SCIENCES

JUNE COMMON TEST

MARKING GUIDELINE

2022

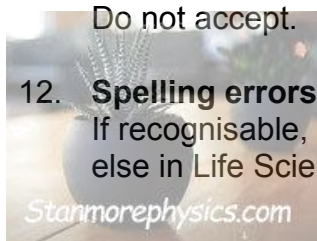


MARKS: 120

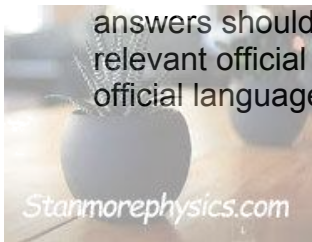
N.B This marking guideline consist of 8 pages.

PRINCIPLES RELATED TO MARKING LIFE SCIENCES

- 1. If more information than marks allocated is given**
Stop marking when maximum marks is reached and put a wavy line and 'max' in the right-hand margin.
- 2. If, for example, three reasons are required and five are given**
Mark the first three irrespective of whether all or some are correct/incorrect.
- 3. If whole process is given when only a part of it is required**
Read all and credit the relevant part.
- 4. If comparisons are asked for but descriptions are given**
Accept if the differences/similarities are clear.
- 5. If tabulation is required but paragraphs are given**
Candidates will lose marks for not tabulating.
- 6. If diagrams are given with annotations when descriptions are required**
Candidates will lose marks.
- 7. If flow charts are given instead of descriptions**
Candidates will lose marks.
- 8. If sequence is muddled and links do not make sense**
Where sequence and links are correct, credit. Where sequence and links are incorrect, do not credit. If sequence and links become correct again, resume credit.
- 9. Non-recognised abbreviations**
Accept if first defined in answer. If not defined, do not credit the unrecognised abbreviation but credit the rest of the answer if correct.
- 10. Wrong numbering**
If answer fits into the correct sequence of questions but the wrong number is given, it is acceptable.
- 11. If language used changes the intended meaning**
Do not accept.
- 12. Spelling errors**
If recognisable, accept the answer, provided it does not mean something else in Life Sciences or if it is out of context.



13. **If common names are given in terminology**
Accept, provided it was accepted at the national memo discussion meeting.
14. **If only the letter is asked for but only the name is given (and vice versa)**
15. **If units are not given in measurements**
Candidates will lose marks. Memorandum will allocate marks for units separately.
16. **Be sensitive to the sense of an answer, which may be stated in a different way.**
17. **Caption**
All illustrations (diagrams, graphs, tables, etc.) must have a caption.
18. **Code-switching of official languages (terms and concepts)**
A single word or two that appear(s) in any official language other than the learners' assessment language used to the greatest extent in his/her answers should be credited if it is correct. A marker that is proficient in the relevant official language should be consulted. This is applicable to all official languages.



SECTION A

QUESTION 1

- 1.1 1.1.1 D✓✓
- 1.1.2 B✓✓
- 1.1.3 A✓✓
- 1.1.4 D✓✓
- 1.1.5 C✓✓
- 1.1.6 C✓✓
- 1.1.7 A✓✓



2X6 (14)

- 1.2 1.2.1 Lipids ✓/fats
- 1.2.2 Vertebral column✓ /vertebrae
- 1.2.3 Fine adjustment knob✓
- 1.2.4 Diffusion✓
- 1.2.5 Cuboidal epithelium ✓
- 1.2.6 Phloem✓
- 1.2.7 Tonoplast✓
- 1.2.8 Cranium✓
- 1.2.9 Amino acids

1x9 (9)

- 1.3 1.3.1 None ✓✓
- 1.3.2 A only✓✓
- 1.3.3 B only✓✓
- 1.3.4 A only✓✓

2x4 (8)

- 1.4 1.4.1 (a) Starch ✓
- (b) Fats/lipids✓

(1)
(1)

1.4.2 Glucose✓

(1)

1.4.3 They are source of energy✓
They are energy storage molecules eg starch and glycogen✓

(2)

1.4.4 red orange✓

(1)

1.4.5 Benedict's solution ✓ /Fehling solution A and B

(1)

1.4.6 Brown ✓/take the colour of iodine solution

(1)

1.4.7 Glucose✓

(1)

(9)

TOTAL SECTION A: 40

SECTION B

QUESTION 2

2.1 2.1.1 Ciliated columnar epithelium✓ (1)

2.1.2 Nucleus✓ (1)

2.1.3 A✓ (1)

2.1.4 -Has goblet cells✓
 -That produces mucus to trap the germs/moisten the surface✓
 -Has cilia✓
 -Remove dust particles ✓ (4)
(Mark the first TWO only) (7)



2.2 -Cells are elongated✓/ joined end to end✓
 -Forming long, continuous tubes✓
 -cells are non-living✓/have no cell contents to enable the movement of water✓
 -Contained thickened✓ / lignified walls to withstand pressure of water✓
 -Perforated with pits ✓for lateral water transport ✓
(Mark the first THREE only) 2x3 (6)


2.3 2.3.1 (a) rate of transpiration in leaves✓ (2)
 (b) Different light intensity✓ (1)

2.3.2 It increased the rate of transpiration✓ /remained constant (1)

2.3.3 There might be other limiting factors✓ that became in short supply that led to no further increase in transpiration rate ✓ (2)

2.3.4 Repeat the investigation✓
 Increase sample size✓
 Calculate the average ✓
(Mark the first TWO only) (2)

2.3.5 Humidity✓
 Temperature✓
 Wind ✓
(Mark the first TWO only) (2)

- 2.3.6 For control✓ so that results can be compared✓ (2)
- 2.3.7 The rate of transpiration increases with an increase in light intensity ✓✓ up to a point where it no longer increases (2)
(13)
- 
- 2.4 2.4.1 Anaphase ✓ (1)
- 2.4.2 Spindle fibres had contracted✓
 Chromatids are pulling towards opposite poles✓
(Mark the first TWO only) (2)
- 2.4.3 (a) cell membrane✓ (1)
 (b) spindle fibre✓ (1)
- 2.4.4 D✓ – Centriole/Centrosome✓ (2)
- 2.4.5 Metaphase*✓
 Chromosomes arrange themselves along the equator✓
 Chromosome attach to spindle fibres✓
 By centromeres✓
(*compulsory + Any 3) (4)
- 2.4.6 - Responsible for growth and development✓
 - Responsible for asexual reproduction✓
 - Replacement of dead✓ / lost cells
 - Repair of damaged cells ✓/ worn-out cells
(Mark the first THREE only) (3)
(14)
- TOTAL QUESTION 2 [40]**

QUESTION 3

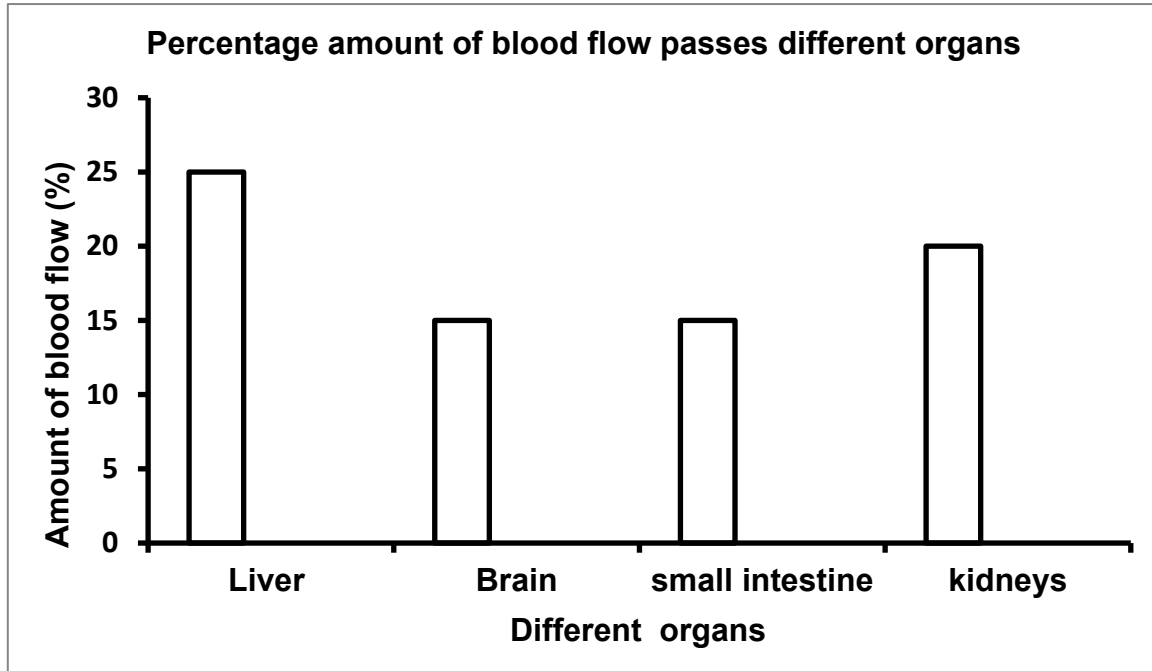
- 3.1 3.1.1 (a) Golgi apparatus✓ (1)
 (b) Chloroplast✓ (1)
- 3.1.2 Plant cell *✓
 -Have large vacuole✓
 -Have chloroplast✓
 -Have cell wall✓ (4)
 -Have fixed shape ✓
- (Mark *compulsory + first THREE only)**
- 3.1.3 Protects the inner parts of the plant cell✓
 Gives plant cells a regular shape✓ (3)
 Provide support to the plant body✓

(Mark the first THREE only)

3.1.4 B✓/ mitochondria provides energy✓ ,for contraction of muscles✓for (3)
movement

3.1.5 - chlorophyll*✓
-which traps the radiant energy from the sun✓
-and use this energy to produce sugars during photosynthesis✓ (3)
(*compulsory + Any 2) (15)

3.2 3.2.1



Marking criteria:

Features	Mark allocation
Caption (C)	1
Correct type of graph (T)	1
Correct labels on X-axis and Y-axis with units (L)	1
Correct scale on X-axis and Y-axis with equal width and equal spaces between bars (S)	1
Correct plotting (P)	1-3 bars plotted correct: 1 All 4bars plotted correct: 2

(6)

3.2.2 $(25+15+15+20) = 75✓$
 $100 - 75✓ = 25%✓$

(3)

(9)



3.3

✓

Artery	Vein
Has thick outer walls✓	Has thin outer walls✓
Has thick layer of muscle fibres and elastic fibres✓	Has thin layer of muscles and elastic fibres✓
Has small lumen (space) ✓	Has large lumen (space) ✓
No valves present✓	Valves are present✓

(Mark the first TWO only+ 1 for the table) (5)

- 3.4 3.4.1 (a) substrate molecule✓ (1)
 (b) enzyme-substrate molecule✓ (1)
 (c) products✓ (1)



(14)

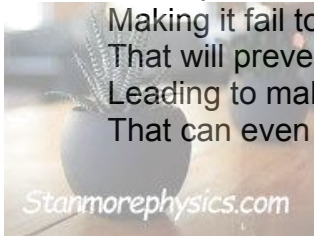
3.4.2 Enzymes are specific✓ to the reaction they catalyse (1)

3.4.3 -Enzymes are sensitive to temperature✓
 -Enzymes are sensitive to pH✓
 -Enzymes can be used repeatedly✓ (2)

(Mark the first TWO only)

3.4.4 To show that the enzyme has catalysed/acted on the substrate molecule (1)

3.4.5 When part N/ enzyme become denatured, it loses its shape✓
 Making it fail to bind with substrate molecule✓
 That will prevent biochemical reactions to occur at faster rate✓
 Leading to malfunctioning of the body✓
 That can even lead to death ✓



Any (4)

(11)

TOTAL QUESTION 3 (40)

TOTAL SECTION B (80)

GRAND TOTAL [120]