Education and Sport Development
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NORTH WEST PROVINCE

PROVINCIAL ASSESSMENT

GRADE 10

LIFE SCIENCES
JUNE 2018 EXAMINATION
Memorandum

MARKS: 150

This memo consists of 9 pages.

SECTION A

QUESTION 1

1.1

1.1.1 A √√
1.1.2 C √√
1.1.3 B √√
1.1.4 B √√
1.1.5 B √√
1.1.6 D √√
1.1.7 C √√
1.1.8 B √√
1.1.9 B √√
1.1.10 A √√ (10 × 2) (**20**)

1.2

1.2.1 Electron micrograph/micrograph√
1.2.2 Substrate√
1.2.3 Foramen magnum√
1.2.4 Antagonistic muscles √
1.2.5 Kwashiorkor√
1.2.6 Floating ribs√
1.2.7 Mitochondrion√
1.2.8 Ciliated epithelial tissue√ (8 × 1) (**8**)

1.3

1.3.1 None √√
1.3.2 B only √√
1.3.3 B only √√
1.3.4 Both A and B √√
1.3.5 B only √√
1.3.6 A only √√
1.3.7 A only √√
1.3.8 None √√ (8 × 2) (**16**)

1.4

1.4.1 1-eye piece/ocular√
3-objectve lens√
7-coarse adjustment√ (3)

1.4.2 For attachment√ of objective lens
Rotates to select√ objective lens (Any 1) (1)

1.4.3 Lower the cover slip√ slowly from one side√ using a needle√ Any 2) (2)

[6]

TOTAL QUESTION 1: 50

TOTAL SECTION A : 50

SECTION B

QUESTION 2

2. 1

2.1.1 A- Epidermis √
B- Bone√ tissue
D- Cartilage√ (3)

2.1.2
(a) C√ (1)
(b) D√ (1)
(c) B√ (1)
[6]

2.2

2.2.1 Columnar epithelial tissue√
2.2.2 In voluntary muscles√
2.2.3 Carries impulses√ **[3]**

2.3

2.3.1 a) Lean beef√ (1)
(b) Milk√
(1)

2.3.2 Lean beef √ and chicken√ (2)

2.3.3 Beans√ (1)

2.3.4 It has very high carbohydrate content√ (1)
[6]

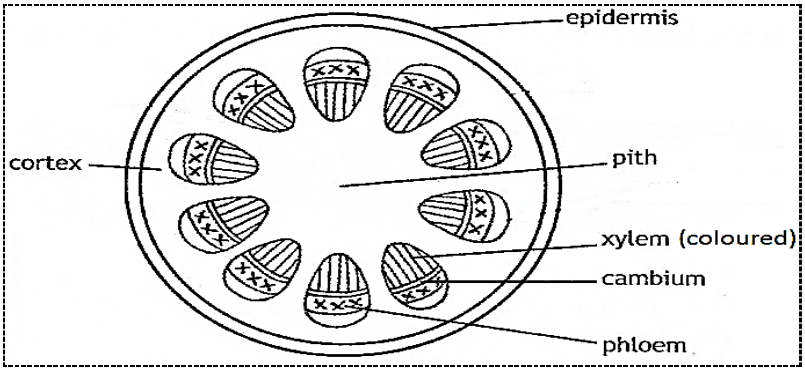
2.4

2.4.1 Is the loss of water as vapour√ through stomata of plants√. (2)
2.4.2 Humidity √ (1)
2.4.3 Sunlight√
Temperature√
Wind speed√ (First 2) (2)

2.4.4 xylem√ (1)

2.4.5

Cross section of dicotyledonous plant stem



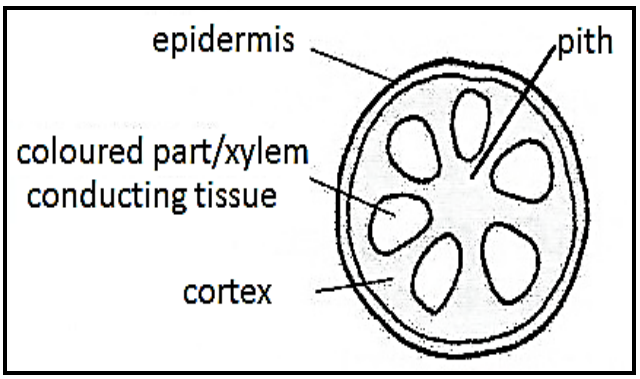
(6)

RUBRIC FOR DIAGRAM

Criteria	Mark
Caption	1
Correct diagram	1
Coloured part/red/xylem	1
Any other 3 correctly labeled parts	3

[12]

Also accept:



2.5

2.5.1 Animal cell √ (1)

2.5.2 Presence of cell membrane only √
No cell wall √
Presence of centriole √
Irregular shape √ (First 2) (2)

2.5.3

(a) F √ (1)

(b) E √ (1)

2.5.4.

(a) Tonoplast√ (1)

(b) Gives rigidity/turgidity/turgor pressure √ to the cell
Maintains shape √/swollen appearance to the cell
Storage of cell sap with water and salts √
Stores pigment √ that give colour to petals of flowers
Plays a part in water balance √ in cells/osmosis (First 2) (2)

2.5.5

Plant cell	Animal cell
Regular shape √	Irregular shape √
Cell wall present √	Cell wall absent √
large vacuole present √	small or absent vacuole √
Plastids present √	Plastids absent √
No micro-villi on cell membrane √	Cell membrane has micro-villi √
No centrioles √	Centrioles present √
Lysosomes not clearly visible/usually absent √	Lysosomes present or clearly visible √
Stores starch √	Stores glycogen √

Table√

(1)

(First 2 correct differences√√√√ (2×2)

(4)

(5

[13]

TOTAL QUESTION 2: 40

QUESTION 3

3.1.

3.1.1 A√

(1)

3.1.2 It is not used up√ in the chemical reaction/it retains its shape√ before and after the reaction (Any 1)

(1)

3.1.3 Enzyme-substrate complex√

(1)

3.1.4 The lock and key theory√

(1)

3.1.5 They speed up chemical reactions√/are biological catalysts√/control chemical processes√ (Any 1)

(1)

3.1.6 The enzyme would become denatured √/ permanently lose its shape.
The enzyme would finally stop functioning√ and the chemical reaction would slow down or stop√

(3)

[8]

3.2.

3.2.1 Stem cells are actively dividing √ cells that are not yet differentiated √/ not yet mature to give rise to different types of cells/cells with no function yet which can develop into any tissue √ or organ (Any 2)
(2)

3.2.2 Embryos√
Cord blood √/Blood in umbilical cord
Placenta √
Adult bone marrow √ (First 2)
(2)

3.2.3 Can be used to form new pancreatic ∨ cells to treat diabetes ∨
To produce new blood cells ∨ for leukaemia ∨ patients
To produce new nerve ∨ cells for Alzheimer ∨ disease patients
Growing new tissues ∨/organs/skin for the same person from cord blood from umbilical cord ∨
Can be used for the treatment of Parkinson's disease ∨, where the stem cell can be used to produce more brain cells ∨
Can be used for the treatment of spinal cord injuries ∨ since the spinal cord cannot repair itself ∨ (First 2×2)
(4)

3.2.4

(a) Stem cells: provide replacements for tissues √, organs damaged by age/diseases etc.
Can treat diseases √and save people's lives √
Can be stored for future use √ e.g. in cord blood banks √
Embryos are not yet human √ since they are undifferentiated √ cells.
(First 1× 2)
(2)

(b) It's immoral ∨ to harvest and destroy stem cells/human beings are destroyed ∨
Can lead to illegal trade ∨ in embryos to make money ∨
Dangers of use of stem cells are unknown ∨ and may be a risk ∨
It's an expensive ∨ research and money could be used for other immediate needs ∨
Its man 'playing God' ∨ and interferes with religion is unethical ∨
Only rich people can afford ∨ to store stem cells for later use. ∨ (First 1×2)
(2)

[12]

3.3

3.3.1Cancer- causing agents (anything that causes cancer) ∨
(1)

3.3.2 lung cancer√

(1)

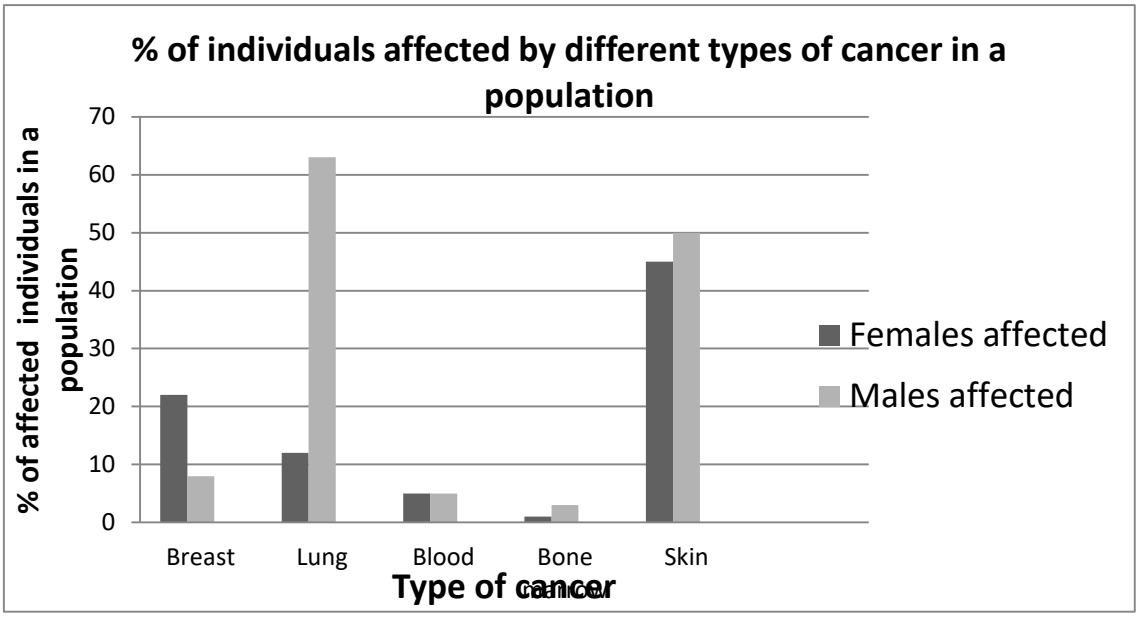
3.3.3 (a) Type of cancer √

(1)

(b) % of affected individuals in a population √

(1)

3.3.4



RUBRIC FOR MARKING THE GRAPH

Criteria	Mark(s)
Caption	1
Correct type of graph	1
X-axis and Y-axis labeled correctly	1
Correct and uniform Y-axis scale	1
Equal width of bars and intervals	1
Key provided/labeling	1
Plotting of graphs	1 1-3 bars correct 2 4-7 bars correct 3 All bars correct

(9)

[13]

3.4

3.4.1 A – cartilage disk ✓
C – pelvic girdle /ilium✓
E – femur✓ (3)

3.4.2 arthritis ✓, osteoporosis ✓, osteoarthritis ✓, rickets✓ (first one) (1)

3.4.3 (a) ball and socket/ freely moveable joint/ synovial joint ✓
(b) partly movable joint✓ (2)

3.4.4 tendons join muscles to bone ✓ (1)

TOTAL

QUESTION 3: 40

[7]

TOTAL SECTION B : 80

SECTION C

QUESTION 4

Mitosis:

Mitosis is the process during which somatic cells divide into✓ new cells for growth or to repair damaged cells.

During interphase the cell is getting ready✓ for mitosis, and the genetic material is replicated✓.

(any 2) (2)

Prophase✓ ** compulsory mark*

In the nucleus, the chromosomes become shorter, thicker and more visible.✓

The nuclear membrane disappears.✓

The centrioles move to the poles✓ and spindle fibres start to develop between them.✓

(*compulsory mark* + any 2) (3)

Metaphase✓** compulsory mark*

The chromosomes, which are chromatids✓ joined at the centromere✓, align on the equator✓ (in the middle) of the cell. The chromosomes attach✓ to the spindle fibres

(*compulsory mark* + any 1) (2)

Anaphase✓** compulsory mark*

The chromosomes split✓ at the centromere into two chromatids.

The chromatids move✓ to the opposite ends, because of the spindle fibres contracting.

(*compulsory mark* + any 1) (2)

Telophase✓** compulsory mark*

The chromatids have reached ✓the poles and a nuclear membrane starts to form✓ around the two sets of chromatids. Cytokinesis takes place✓ and the cell splits into two daughter cells.✓Each daughter cell has the same amount of chromosomes✓ as the mother cell.

(*compulsory mark* + any 2) (3)

Cancer

It occurs as a result of uncontrolled cell division✓ by means of mitosis.✓

The system that controls cell division stops functioning correctly in some cells.

Uncontrolled cell division then results in a group or mass of undifferentiated cells✓ all of which divide in an uncontrolled way✓.

The growth of this group of cells results in the formation of a structure called a tumour✓.

The tumour can be benign✓, that is non-cancerous.

The tumour can be malignant✓, that is cancerous. (any 5) (5)

NB: Names of different phases must be mentioned as well as the information for each phase.

ASSESSING THE PRESENTATION OF THE ESSAY

Criterion	Elaboration	Mark
Relevance (R)	All information provided is relevant to the process of mitosis and to what cancer is.	1
Logical sequence (L)	Ideas are arranged in a logical sequence.	1
Comprehension (C)	All aspects of the stages of mitosis (9/12) together with description of cancer (4/5) have been addressed	1

Content (17)

Synthesis (3) **[20]TOTAL SECTION C: 20**

GRAND TOTAL: 150