

BIOLOGY

UNIT 1



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Use this page as an overlay for marking the multiple choice answer sheets. Simply photocopy the page onto an overhead projector sheet. The correct answers are open boxes below. Students should have shaded their answers. Therefore, any open box with shading inside it is correct and scores 1 mark.

	ONE ANSWER PER LINE		ONE ANSWER PER LINE
1	<input type="checkbox"/> [shaded] [shaded]	14	[shaded] [shaded] <input type="checkbox"/>
2	<input type="checkbox"/> [shaded] [shaded]	15	[shaded] <input type="checkbox"/> [shaded]
3	[shaded] [shaded] <input type="checkbox"/>	16	<input type="checkbox"/> [shaded] [shaded]
4	[shaded] <input type="checkbox"/> [shaded]	17	[shaded] [shaded] <input type="checkbox"/>
5	[shaded] <input type="checkbox"/> [shaded]	18	[shaded] [shaded] <input type="checkbox"/>
6	<input type="checkbox"/> [shaded] [shaded]	19	<input type="checkbox"/> [shaded] [shaded]
7	[shaded] [shaded] <input type="checkbox"/> [shaded]	20	[shaded] [shaded] <input type="checkbox"/> [shaded]
8	[shaded] [shaded] <input type="checkbox"/> [shaded]	21	[shaded] <input type="checkbox"/> [shaded]
9	[shaded] [shaded] <input type="checkbox"/>	22	[shaded] [shaded] <input type="checkbox"/> [shaded]
10	<input type="checkbox"/> [shaded] [shaded]	23	[shaded] [shaded] <input type="checkbox"/>
11	[shaded] [shaded] <input type="checkbox"/>	24	[shaded] <input type="checkbox"/> [shaded]
12	[shaded] <input type="checkbox"/> [shaded]	25	<input type="checkbox"/> [shaded] [shaded]
13	[shaded] [shaded] <input type="checkbox"/> [shaded]		

TEACHERS, PLEASE NOTE:

*In marking the Exam, teachers should keep in mind that the language used in the suggested answers is sometimes more sophisticated than a student would offer since these answers are written for teachers' information in their correction of the Exam. The answers suggested here might not be the only correct responses possible. Teachers must use their professional judgement in awarding marks for other answers offered. However, in accordance with the VCAA practice, students who give a correct response, and then offer a contradictory incorrect response within the same part of the question, should **not** be awarded any marks for the correct part of the response. Also in accordance with the VCAA practice, no half marks should be given.*

SECTION A – Multiple Choice Questions (1 mark each: 25 marks)

1	A	14	D
2	A	15	B
3	D	16	A
4	B	17	D
5	B	18	D
6	A	19	A
7	C	20	C
8	C	21	B
9	D	22	C
10	A	23	D
11	D	24	B
12	B	25	A
13	C		

SECTION B**Question 1**

- a** Guard cell OR stomata (1). Regulates gas exchange (1). 2 marks
- b** Potassium / solutes enter the guard cells (1) creating a concentration gradient, with water entering via osmosis (1). The water makes the cell turgid causing it to swell (1), opening the stomata. 3 marks
- c** Any two of the following for 1 mark each:
Presence of: linear chromosomes, membrane bound organelles, defined nucleus, larger in size. (Not cell wall as some bacterial cells have cell walls.) 2 marks
- d** A leaf has a high surface area to volume ratio (1) which enables efficient gas exchange to occur (1). 2 marks
- Total Question 1: 9 marks**

Question 2

- a** Blebbing (1). Cell contents OR microfilaments are cleaved (1). 2 marks
- b** They both use caspases to cleave cell contents (1) & blebbing of the membrane occurs (1). 2 marks
- c** Pluripotent stem cells give rise to any cell comprising of the three cell lineages ectoderm, endoderm and mesoderm (1).
Totipotent stem cells give rise to all cells of the embryo proper (ectoderm, endoderm and mesoderm) and the extraembryonic cells of the placenta (1). 2 marks
- d** Totipotent as they can give rise to embryonic cells, they can develop into an organism (1). Pluripotent stem cells can give rise to any cells of the embryo but not the placenta so could not be carried to term (1). 2 marks
- Total Question 2: 8 marks**

Question 3

- a** G1 checks for sufficient nutrients, growth factors and DNA damage in the parental cell (1) and occurs during the G1 stage of the cell cycle (1). 2 marks
- b** Any one of the following for 1 mark:
Smoking, exposure to UV, exposure to carcinogenic chemicals or radiation or any other suitable answer. 1 mark
- c** All wild type cells show less than 5% mitotic index (1).
All three mutant cells show a significantly higher peak (ranging from 15 – 30%) (1). 2 marks
- d** Any one of the following for 2 marks:
Cancer cells do not differentiate correctly (1) and may produce toxins (1).
Cancer cells have abnormal membranes (1) so cannot regulate what enters and exits the cell (1).
Cancer cells have mutations in the DNA (1) creating codes for non-functional proteins (1). 2 marks

Total Question 3: 7 marks**Question 4**

- a** Osmosis (1). Ions cannot pass through the membrane by simple diffusion (1), due to the concentration gradient, water enters to reach equilibrium (1). 3 marks
- b** Water moves along the concentration gradient from high levels of water to low levels of water (1). When there is low humidity there is less water in the environment and the rate of transpiration is higher (1). When the water content in the air is high (humid) there is more water in the environment and the rate of transpiration decreases (1). 3 marks
- c** Sieve cells move sugars via translocation (1) and move sugars to sink cells for immediate use or storage (1). 2 marks

Total Question 4: 8 marks**Question 5**

- a** Food is ingested and glucose is absorbed in the small intestine – increasing blood glucose levels (1). The pancreas releases insulin that promotes the uptake of glucose in cells, decreasing blood glucose levels (1). When blood glucose levels fall too low, glucagon is released causing glucose to be released back into the bloodstream, increasing blood glucose levels (1). 3 marks
- b** Student 2 is correct (no mark).
Bile breaks down fat into smaller pieces as mechanical digestion does (1), increasing the surface area for enzymes to chemically act upon it (1). 2 marks
- c** Descending limb – permeable. Ascending limb – impermeable (1). 1 mark
- d** The descending limb of the loop of Henle is permeable to water but not salts, while the ascending limb of the loop of Henle is permeable to salts but not water (1). As the loop descends, the interstitial fluid becomes hypertonic / salty (1). The hypertonic environment draws water out via osmosis (1), with less water in the filtrate and a more concentrated urine is produced (1). 4 marks

Total Question 5: 10 marks**Question 6**

- a** Homeostasis maintains a relatively stable internal environment (1) with the response negating the original stimulus (1). In hyperthyroidism, TSH continues to be released despite there being sufficient hormone in the body (1). 3 marks
- b** The hypothalamus and pituitary are both considered to be master glands (1).
Blocking their action would adversely affect homeostatic mechanisms (such as temperature regulation) (1). 2 marks
- c** control group 1 mark
- d** The expected results would be a decrease in TSH in the bloodstream of those taking the active drug (1) as sufferers with hyperthyroidism produce excess TSH. If the drug is effective, the release of the hormone will decrease (1). 2 marks

Total Question 6: 8 marks**END OF SUGGESTED SOLUTIONS**

