

Section A Multiple Choice Questions

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

Section B Short Answer**Question 1 (9 marks)**

- a. (i) Lipid. (1 mark)
(ii) One glycerol and three fatty acids. (1 mark)
(iii) No, because triglycerides are not made up of repeating monomers. (1 mark)
(iv) Hydrophobic, as they do not dissolve in water (that is, insoluble). (1 mark)
- b. (i) F → D → B. (1 mark)
(ii) Exocytosis. (1 mark)
(iii) Nucleus contains DNA which has the specific base codes (nucleotide sequences). (1 mark)
- c. To provide energy as ATP from aerobic respiration for protein synthesis and exocytosis. (1 mark)

Question 2 (9 marks)

- a. (i) Solution B is more concentrated (higher in solute) as net water movement is out of the cell. (1 mark)
(ii) Cell (plasma) membrane. (1 mark)
- b. (i) Plasmolysed. (1 mark)
(ii) Osmosis – net water movement from cytosol and vacuole of cell into external solution. (1 mark)
- c.

	X	Y
Name of structure or area	Stoma (½ mark)	Grana (½ mark)
Name of stage of photosynthesis that occurs in that structure or area	Light-independent stage (½ mark)	Light-dependent stage (½ mark)
Products or output of the reaction occurring in that structure or area	1. Glucose (C ₆ H ₁₂ O ₆) (PGAL is actually the correct answer). 2. 'Unloaded' carrier molecules (NAD). 3. ADP and P _i (1½ marks)	1. Oxygen (O ₂) 2. 'Loaded' carrier molecules (NADH) 3. ATP (1½ marks)

Question 3 (6 marks)

- a. (i) Photoperiod. (1 mark)
(ii) In the leaves. (1 mark)
- b. P_{fr} (Phytochrome 730). (1 mark)
- c. (i) Relatively short period of darkness with longer periods of light. (1 mark)
(ii) P_{fr} (Phytochrome 730). (1 mark)
(iii) In the tropics night length is not short enough to initiate flowering; whereas in the Southern Australian summer the relatively short nights will trigger flowering. (1 mark)

Question 4 (7 marks)

- a. (i) Aerobic respiration. (1 mark)
- (ii) Mitochondria. (1 mark)
- (iii) Electron transport. (1 mark)
- b. $\text{ADP} + \text{P}_i \rightarrow \text{ATP}$. (1 mark)
- c. The energy released in the breakdown of pyruvic acid to water (an exergonic reaction) (1 mark) is then used to 'drive'
- d. Cyanide blocks the active sites of the cytochrome c oxidase enzyme so it can no longer catalyse the reaction. Very little energy will be released in cellular respiration resulting in death. (1 mark)

Question 5

- a. $3 \rightarrow 6 \rightarrow 1 \rightarrow 2 \rightarrow 5 \rightarrow 4$ (1 mark)
- b. (i) Skeletal muscle cells. (1 mark)
- (ii) Diffusion. (1 mark)
- (iii) Acetylcholine transmitter substance briefly binds or "locks into" receptor sites on the post-synaptic membrane. (1 mark)
- c. Curare "locks into" the receptor sites on the post-synaptic muscle cells. This would inhibit acetylcholine binding to these receptors therefore no muscle contraction will occur. (1 mark)
- d. (i) Any two of: concentration of acetylcholinase; temperature; or pH. (2 marks)
- (ii) Anabolic reaction (or synthesis). (1 mark)
- e. Neurotransmitter travels in the intracellular fluid.
Hormone travels in the blood.
Pheromone travels in the air. (1 mark)

Question 6

- a. (i) Prion – non-cellular; Tetanus bacterium – cellular
or
Prion – protein only; Tetanus bacterium – DNA, protein, etc.
or
Any other reasonable suggestion. (1 mark)
- (ii) Blood fluke – multicellular; Tetanus bacterium - unicellular
or
Blood fluke – membrane-bound organelles in cells; Tetanus bacterium – non membrane-bound organelles in cells
or
Any other reasonable suggestion. (1 mark)
- b. (i) Inflammation *or* redness in area of wound *or* hot in area of wound. (1 mark)
- (ii) More phagocytes to area of wound to engulf tetanus bacteria. (1 mark)
- c. (i) Injection of antibiotics to kill tetanus bacteria. (1 mark)
- (ii) Injection of tetanus toxin antibodies (immuno-globulins) to give immediate protection from the toxin. (1 mark)
- d. (i) Antibodies to tetanus toxin. (1 mark)
- (ii) Very high following initial injection, then decreasing over time as the antibody proteins are broken down in the body. (1 mark)
- e. (i) Farmer was vaccinated with three injections during the first eight months of the year and then given a booster at 12 months. (1 mark)
- (ii) Farmer was given another booster at five years or was exposed to the tetanus toxin again (perhaps another accident!). (1 mark)