

Paper 1

卷一

Section A

甲部

1	D	11	A	21	D	31	C
2	B	12	D	22	C	32	D
3	C	13	D	23	C	33	A
4	B	14	A	24	A	34	C
5	C	15	C	25	B	35	D
6	C	16	D	26	B	36	C
7	B	17	D	27	B		
8	D	18	C	28	B		
9	D	19	D	29	D		
10	C	20	B	30	D		

Section B

乙部

1. (a) C (1)
(b) A (1)
(c) E (1)

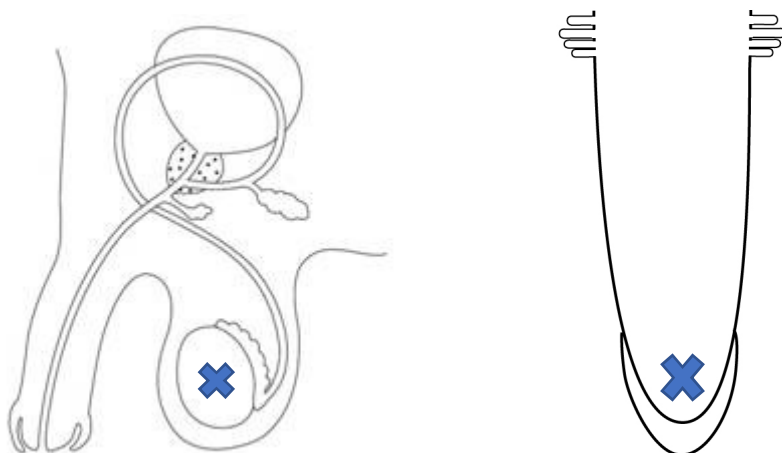
2. - Loss of water through evaporation from the plant surfaces, the water potential of cell decreases, (1)
- Difference in water potential of cells creating a water potential gradient (1)
- Water gain from neighbouring cells by osmosis, until to the xylem (1)
- Creating a transpiration pull, drawing water from the xylem, (1)
- Evaporation of water removes heat from the plant or; (1)
- Creates a transpiration pull, which promote the transport of water and minerals from the root to leaves or; (1)
- Facilitates the absorption of water and minerals by the roots. (1)

(any 2)

- 通過從植物表面蒸發而散失的水，細胞的水勢降低， (1)
- 細胞水勢的差異 產生水勢梯度 (1)
- 通過滲透從鄰近細胞獲得水，直至到達木質部 (1)
- 產生蒸騰拉力，從木質部吸水， (1)
- 水的蒸發帶走植物的熱能，或者 (1)
- 產生蒸騰拉力，促進水和礦物質的運輸 從根到葉或 (1)
- 促進根部吸收水分和礦物質。 (1)

(任何 2)

3. (a)



- (b) A: Meiotic cell division, (1)
B: Mitotic cell division (1)

- (c) Mitotic cell division:
- No genetic variation, genetic stability or; (1)
 - Growth and repair or; (1)
 - Asexual reproduction (1)
- (any 2)

Meiotic cell division:

- Conserve the number of chromosomes in successive generation or; (1)
 - Produce haploid gamete, become diploid after fertilization or; (1)
- (any 1)
- Provide genetic variation (1)

- (b) A: 減數細胞分裂, (1)
B: 有絲細胞分裂 (1)

- (c) 有絲細胞分裂:
- 沒有遺傳變異, 遺傳穩定性 或; (1)
 - 生長與修復 或 ; (1)
 - 無性生殖, 無性繁殖 (1)
- (任何 2)

減數細胞分裂:

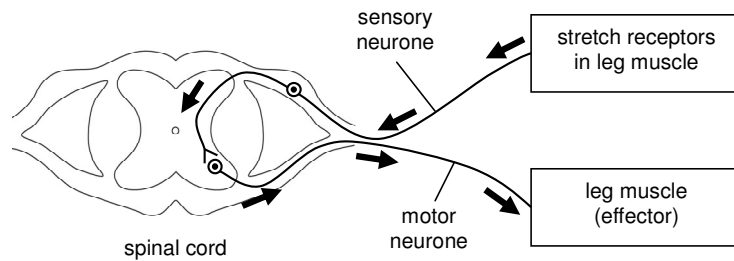
- 保存連續世代中的染色體數目; 保存後代的染色體數目或 (1)
 - 產生單倍體配子, 受精後成為二倍體或; (1)
- (任何 1)
- 提供遺傳變異 (1)

4. (a) - The water potential of the plasma gradually decreases (1)
- Then increases again from the arterial end to the venous end of the capillaries. (1)
- (b) - In the arterial end, the pressure of the blood is higher than the pressure of the tissue fluid. (1)
- Water moves from the plasma to the tissue fluid by osmosis and the water potential of the plasma gradually decreases. (1)
- In the venous end, the pressure of the blood is lower than the pressure of the tissue fluid. (1)
- Water moves from the tissue fluid to the plasma by osmosis and the water potential of the plasma gradually increases (1)
- (a) - 血漿的水勢逐漸降低 (1)
- 然後從毛細管的動脈末端到靜脈末端再次增加。 (1)
- (b) - 在動脈末端，血液的壓力高於組織液的壓力。 (1)
- 水通過滲透作用從血漿移動到組織液，血漿的水勢逐漸降低。 (1)
- 在靜脈末端，血液的壓力低於組織液的壓力。 (1)
- 水通過滲透作用從組織液流向血漿，血漿的水勢逐漸增加 (1)

5. - The structure of ethanol is similar to that of ethylene glycol (1)
- They both can bind to the active site of alcohol dehydrogenase (1)
- Some of the active site are occupied by the ethanol (1)
- Lowers the rate of formation of oxalic acid and reduce the harmful effect (1)
-
- 乙醇的結構類似於乙二醇 (1)
- 它們都可以結合酒精脫氫酶的活性部位 (1)
- 一些活性部位被乙醇佔據 (1)
- 降低草酸的生成速率並減少有害作用 (1)

6. (a) - large petals or; (1)
 - Brightly coloured (1)
 (any 1)
- (b) Advantages of cross-pollination:
 - Healthier, stronger and more enduring offsprings maybe produced (1)
 - Seed are usually healthier and better to survive (1)
 - New varieties differ from parents maybe produced (genetic variation) (1)
 - Less genetic diseases inherited (1)
 - More adapted to changing environment (1)
 (any 2)
- Disadvantages of cross-pollination:
 - More waste pollen grains (1)
 - Need external agents (1)
 (any 1)
- (c) - Open the flower bud (immature), and remove the stamens (1)
 - Brush the stigma with the pollen grains from other plants (1)
 - Enclose the flower with plastic bag to prevent further fertilization (1)
- (a) - 大花瓣或； (1)
 - 顏色鮮豔 (1)
 (任何 1)
- (b) 異花傳粉的優勢：
 - 可能產生更健康，更強壯和更持久的後代 (1)
 - 種子通常更健康地生存 (1)
 - 可能產生與父母不同的新品種（遺傳變異） (1)
 - 遺傳病少
 - 適應不斷變化的環境 (1)
 (任意 2)
- 異花授粉的缺點：
 - 浪費很多的花粉粒 (1)
 - 需要外界傳媒（風／動物） (1)
 (任意 1)
- (c) - 打開花蕾（未成熟），並去除雄蕊 (1)
 - 用其他植物的花粉粒擦掉柱頭 (1)
 - 用塑料袋將花包起來以防止進一步受精 (1)

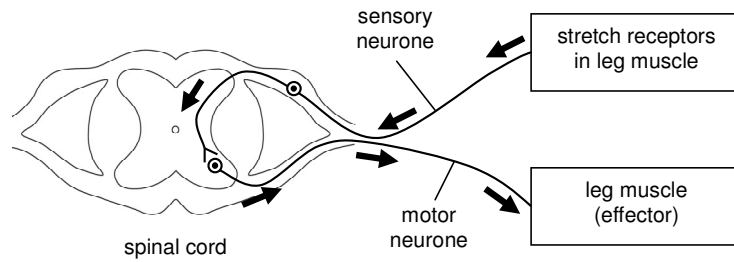
7. (a) Dendron → cell body → Axon (2)
- (b) - The myelin sheath protects and insulates the nerve fibres (1)
- This prevents the transmission of nerve impulse to the surroundings (1)
- Speed up the transmission of nerve impulse. (1)
- (c) Nerve impulse will be slowed down or even stopped (1)
- (d)



****No interneurone****

- Nerve impulse direction (1)
- Sensory neurone (1)
- Motor neurone (1)
- Receptors (1)
- Effector (1)

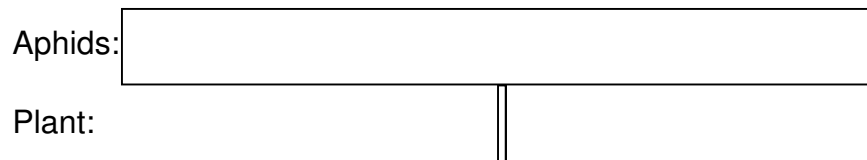
7. (a) 樹突 → 細胞體 → 軸突 (2)
- (b) - 髓鞘保護和絕緣神經纖維 (1)
- 可防止神經衝動傳遞到其他地方 (1)
- 加快近距離脈衝的傳輸。 (1)
- (c) 神經衝動會減慢甚至停止 (1)
- (d)



****無中間神經元****

- 神經衝動方向 (1)
- 感覺神經元 (1)
- 運動神經元 (1)
- 受體 (1)
- 效應器 (1)

8. (a) (i) - Food chain A (1)
 - When energy is transferred from one trophic level to another, there is energy loss. In food chain A, the energy from green plants is directly pass to humans, so the amount of energy lost between trophic levels is the least. (1)
- (ii) - Protein content of insect is greater than green plants or; (1)
 - Farming insects produce less greenhouse gases (e.g. methane) than rearing sheep or; (1)
 - Farming insects require less space than rearing sheep or; (1)
 - A large amount of insects can be grown in shorter time compared with rearing sheep. (1)
- (b) (i) Correct shape and correct label (any 3) (1)



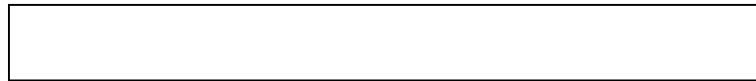
- (ii) - Use of ladybirds can selectively eliminate aphids, while use of insecticides may harm other insects. (1)
 - Indiscriminate use of insecticide would promote the evolution of insecticide resistance in insects (1)
- (Or other reasonable answers)

8. (a) (i) 食物鏈 A (1)
- 當能量從一種營養級(食性層次)轉移到另一個營養級(食性層次)時，會損失能量。在食物鏈 A 中，植物的能量直接傳遞給人類，因此在營養級(食性層次)之間損失的能量最少。 (1)

- (ii) - 昆蟲的蛋白質含量比綠色植物多；或 (1)
- 養殖昆蟲產生的溫室氣體（例如甲烷）比飼養綿羊少； (1)
 - 養殖昆蟲比飼養綿羊所需的空間更小； (1)
 - 與飼養綿羊相比，大量昆蟲可以在更短的時間內生長。 (1)
- (任何 3)

- (b) (i) 正確的形狀和正確的標籤 (1)

蚜蟲:

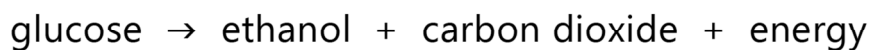


植物:



- (ii) - 使用瓢蟲可以有選擇地消除蚜蟲，而使用殺蟲劑可能會傷害其他昆蟲 (1)
- 濫用殺蟲劑將促進害蟲抗藥性的發展 (1)
- (或其他合理答案)

9. (a)



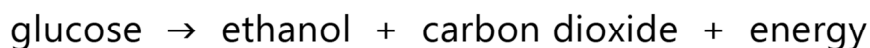
(1)

- (b) - fermentation is an exothermic reaction (1)
- the water jacket is used to cool down the fermentator to maintain suitable temperature for the fermentation (1)

- (c) Agree. (1)
- Ethanol is produced and accumulate in the fermentator (1)
- Ethanol is toxic to yeast and microbes, kill them as the ethanol content is high, fermentation stops (1)

- (d) distillation or fractional distillation (1)

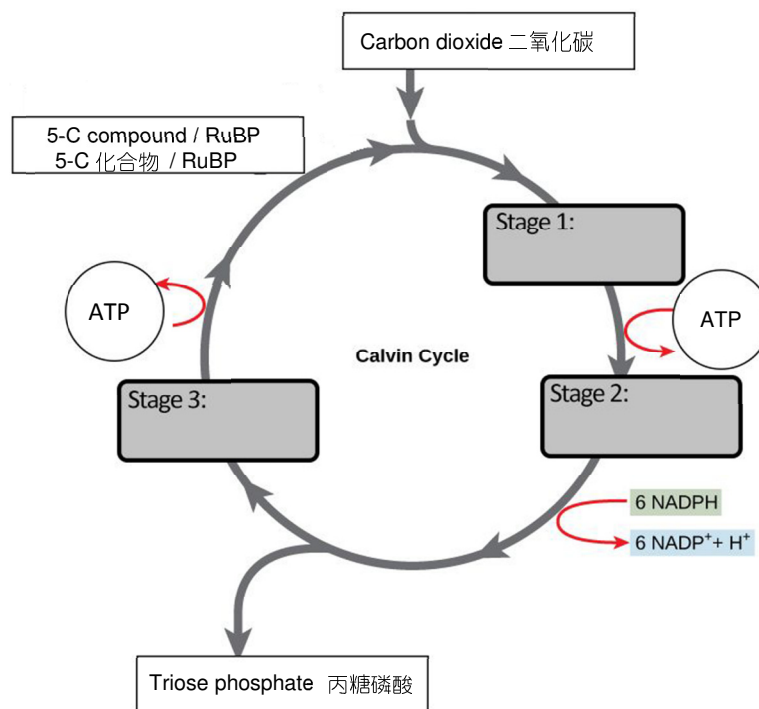
(a)



(1)

- (b) - 發酵是放熱反應 (1)
- 水套用於冷卻發酵罐以維持合適的發酵溫度 (1)
- (c) 同意。 (1)
- 乙醇產生，並在發酵罐中累積 (1)
- 乙醇對酵母和微生物有毒，由於乙醇含量高，會殺死它們，發酵停止 (1)
- (d) 蒸餾或分餾 (1)

10. (a)



- (b) ATP: provide energy for reactions (4)
- NADPH: provide reducing power (1)
- (c) - Use oxygen isotopes to from water and carbon dioxide (1)
- Submerge two water plants with one under the radioactive water and one with the radioactive carbon dioxide. (1)
- Explore the plant to light for at least 24 hours. (1)
- Collect the oxygen they produced after 24 hours. (1)
- Test the oxygen produced by their radioactivity. (1)
-
- (b) - ATP : 為反應提供能量
- NADPH : 提供還原能力
- (c) - 使用氧同位素來去除水和二氧化碳 (1)
- 將兩個自來水廠浸入水中，其中一個浸入放射性水中，另一個浸入放射性二氧化碳中。 (1)
- 將植物點燃至少24小時。 (1)
- 收集24小時後產生的氧氣。 (1)
- 測試其放射性產生的氧氣。 (1)

11. - The allele of sickle cell disease is passed on to offspring from parents (1)
- Codominance, the characteristics of both alleles are visible (co-exist) in the phenotype (1)
 - If only one sickle cell disease allele is passed on to offspring: offspring produce both normal and abnormal shape of red blood cell (thin and elongated) (1)
 - If two sickle cell disease alleles are passed on to offspring: offspring produce abnormal shape of red blood cell (thin and elongated) (1)
 - Sickle cell anaemia is more likely to occur when two sickle cell disease alleles are inherited (1)
 - The foetus is at risk for being a carrier or affected by the disease. (1)
 - abnormal haemoglobin and blood cells are produced by foetus (1)
 - lower oxygen carrying capacity (1)
 - lower growth and development rate. (1)

OR

- oxygen in mother's blood lower than normal (1)
- less oxygen is transported to placenta (1)
- less oxygen is carried to the foetus by the umbilical vein (1)
- lower metabolic rate thus lower growth and development rate. (1)

OR

- Vaso-occlusion, the sickle cell tends to clump together (1)
- block or narrow the blood vessel (1)
- reduce nutrients and oxygen carry to foetus (1)
- lower growth and development rate (1)
- medical treatment, increase the haemoglobin concentration, increase oxygen carrying capacity (1)
- blood transfusion, increase concentration of normal haemoglobin, increase oxygen carrying capacity (1)
- stem cell therapy, bone marrow transplant, replace abnormal red bone marrow, produce normal red blood cells (1)
- Gene therapy, replace abnormal gene, produce normal red blood cells (1)

11. - 鎌狀細胞病的等位基因從父母傳給後代 (1)
- 等顯性，兩個等位基因的特徵在表型中可見（並存） (1)
 - 如果只有一個鎌狀細胞病等位基因傳給後代：後代會同時產生正常和異常形狀的紅細胞（稀薄的和細長的） (1)
 - 如果將兩個鎌狀細胞病等位基因傳給後代：後代會產生異常形狀的紅細胞（稀薄的和細長的） (1)
 - 鎌狀細胞病的兩個等位基因被繼承時，鎌狀細胞性貧血更有可能發生 (1)
-
- 胎兒有被該疾病攜帶或感染的危險。 (1)
 - 胎兒產生異常的血紅蛋白和血細胞 (1)
 - 較低的氧氣攜帶量 (1)
 - 較低的增長和發展速度 (1)

或者

- 母親血液中的氧低於正常水平 (1)
- 更少的氧氣被輸送至胎盤 (1)
- 較少的氧氣通過臍靜脈帶入胎兒 (1)
- 較低的代謝速度，從而降低了生長發育速度 (1)

或者

- 血管閉塞，鎌狀細胞傾向於聚集在一起 (1)
 - 阻塞或挪動血管 (1)
 - 減少營養和氧氣帶給胎兒 (1)
 - 較低的增長率和發展速度 (1)
-
- 藥物治療，增加血紅蛋白濃度，增加氧氣攜帶能力 (1)
 - 輸血，增加正常血紅蛋白的濃度，增加氧氣的吸收能力 (1)
 - 幹細胞療法，骨髓移植，替換異常紅骨髓，產生正常的紅細胞 (1)
 - 基因療法，替換異常基因，不產生紅細胞 (1)