

A2 Miscellaneous 4

- 1) Explain how the following processes occur;
 - a. Electrophoresis (4)
 - b. PCR (4)
- 2) The voltage gated potassium channels in a neurone close prematurely. What problems can this result in? (3)
- 3) Distinguish between temporal and spatial summation? (2)
- 4) Describe how genetic engineering and gene therapy are achieved? (6)
- 5) What are the differences between fast and slow twitch muscle fibres? (4)
- 6) What are the different components of the nitrogen cycle? (4)
- 7) A particular form of hereditary mitochondrial disease inhibits the proton pumps. What effects will this have and why? (3)
- 8) Alcohol and caffeine cause diuresis. How do they do this? (2)
- 9) A person has a hereditary condition where the fenestrations are too large in the basement membrane of the kidney nephrons. What problems will this result in and why? (3)
- 10) What are the key features and types of stem cells? (4)
- 11) What are the genetic bottleneck and founder effect? (2)
- 12) What is the epigenome? (1)
- 13) What is epistasis? (1)
- 14) Explain how the resting membrane potential in a neurone is set up and maintained? (3)
- 15) Why are excess amino acids dangerous? (2)
- 16) What are the roles of the T-tubules and troponin in muscle contraction? (2)
- 17) Describe the differences between cyclic and non-cyclic photophosphorylation? (4)
- 18) If the kidneys fail, the blood pH is disturbed. Explain why? (3)
- 19) Draw the structure of a chloroplast and explain its adaptations? (4)
- 20) Describe a method to measure the biodiversity in an area? (4)

21) How can excess fertiliser make the water in rivers, ponds and lakes putrid? (4)

22) Define the following; (6)

- a. Niche
- b. Climax community
- c. Pioneer species
- d. Secondary succession
- e. Discontinuous variation
- f. Codominance

23) Explain the sequence of events at a synapse? (4)

24) What are the roles of a synapse? (3)

25) What are the typical phenotype ratios expected in; (3)

- a. Dihybrid inheritance
- b. Recessive epistasis
- c. Dominant epistasis

Total: /85