

**A2 Miscellaneous 6**

- 1) Why is NADH a better hydrogen carrier than FADH? (1)
- 2) What are the roles of regulatory genes and transcription factors? (2)
- 3) Outline the steps involved in genetic engineering? (4)
- 4) What are the differences between rods and cones? (5)
- 5) Outline the process of glycolysis? (4)
- 6) What factors affect net primary productivity? (3)
- 7) Explain how phototropism occurs in the shoots? (4)
- 8) How can the respiratory quotient be used to indicate when a person enters anaerobic respiration? (3)
- 9) How many ATP molecules are used in making one glucose molecule in the Calvin cycle? Explain your answer. (3)
- 10) What is saprobial nutrition? (2)
- 11) What is the role of mycorrhizae? (1)
- 12) Draw a labelled diagram of a typical neuromuscular junction? (4)
- 13) Describe the sequence of events in nerve transmission at a cholinergic synapse? (4)
- 14) Draw a labelled diagram of a sarcomere for a contracted and relaxed muscle below? (4)
- 15) Why is heparin used in a dialysis machine? (1)
- 16) Give 3 common causes of kidney failure? (3)
- 17) Why is the glomerular filtration rate a good indicator of kidney function? (3)
- 18) What is the importance of the adrenal gland? (3)
- 19) Explain the differences between the 2 parts of the autonomic nervous system? (6)
- 20) Explain with the help of diagrams the differences between the three different types of natural selection? (6)
- 21) Define the following; (8)
  - a. Niche

- b. Carrying capacity
  - c. Climax community
  - d. Biodiversity
  - e. Statistically significant
  - f. Epistasis
  - g. Epigenetics
  - h. Linkage
- 22) Two genes located on different chromosomes are responsible for controlling the coat colour in a particular breed of cats. The first gene codes for colour where A= pale white and a = light brown. The second gene codes for an enzyme that changes the light brown pigment into a darker grey colour where G= enzyme present and g= enzyme absent. If two heterozygous cats mate, what is the expected ratio of the phenotypes in the F2 generation? Show your working. (6)
- 23) How does speciation occur? (4)
- 24) What does the Hardy- Weinberg principle state and what are the assumptions? (6)
- 25) What is meant by the following terms (3);
- a. Genetic drift
  - b. Genetic bottleneck
  - c. Founder effect
- 26) What are the differences between the two types of gene therapy? (3)
- 27) Explain the process of electrophoresis? (4)

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