

請清楚標示題號並依序作答於試卷上

1. The simplest classification, which is based on the type of cells, divides living organisms into two groups. What are these two groups? (4%)
2. What is the common major component of mitotic spindles and cilia? (4%)
3. Cellular respiration occurs in three main stages, what are these stages? (6%)
4. Please describe Mendel's law of segregation. (6%)
5. If the flower color of a plant is controlled by three unlinked genes, and one dominant allele of each gene is necessary to get red flowers; otherwise, flowers are white. What phenotypic ratios would you predict among the progeny from the self-fertilization of a triple heterozygous plant of these three genes? (6%)
6. What biological implications could be derived directly from the double helical model of DNA which was proposed by Watson and Crick in 1953? (6%)
7. Female mammals have two X chromosomes, whereas males have only one; however, females don't make twice as much of the proteins encoded by genes on the X chromosome compared to the amount in males. Why? (6%)
8. Some plant pathogens secrete chemicals that cause guard cells to accumulate K^+ . Is this helpful to the infection of the pathogens, why? (6%)
9. What is the difference(s) between primary growth and secondary growth in woody plants? (6%)
10. Where does most digestion and absorption occur in the mammalian digestive tract? Give an explanation based on the point of view that structure fits function. (6%)
11. Identify three features that are common to fish gills, insect tracheae, and bird lungs, as well as one trait that is unique to each. (6%)
12. The most remarkable feature of the oxygen-hemoglobin equilibrium curve is that it is sigmoidal or S-shaped. Why does the pattern occur? What's the importance of this pattern? (6%)
13. A vertebrate heart will continue to beat even if all nerves supplying it are severed. Why? (6%)
14. The resting membrane potential of a postsynaptic neuron is -65 mV. Explain what happens to the membrane potential when a ligand-gated ion channel opens and allows chloride ions to leave the neuron. How does this affect the likelihood that the postsynaptic neuron fires an action potential? (6%)
15. Different body cells can respond differently to the same peptide hormone. Why? (4%)
16. What is the osmotic challenge that the marine bony fish face? How do they achieve the osmoregulation? (6%)
17. There are two species of barnacles with distinctive distributions in an intertidal rocky shore. The adults of one species, *C. stellatus*, occur in an upper intertidal zone. The adults of the other species, *B. balanoides*, are restricted to a lower intertidal zone. Design an experiment to directly test the hypothesis that *C. stellatus* is competitively excluded from the lower intertidal zone by *B. balanoides*? (6%)
18. What is ecosystem diversity? (4%)

試題隨卷繳回