

國立中山大學 102 學年度碩士暨碩士專班招生考試試題

科目名稱：普通生物學【海生聯合碩士班】

題號：468001

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共 4 頁 第 1 頁

單選題，每題兩分。不可於試題紙上作答。

1. Which of the following taxonomic categories contains organisms least similar to each other? (1), order; (2), species; (3), genus; (4), family.
2. The transformation from a single cell into an adult individual with many different kinds of cells is called (1), development; (2), inheritance; (3), evolution; (4), adaption.
3. Natural selection in different environments may result in (1), diversity; (2), similarity; (3), inheritance; (4), homeostasis.
4. Nucleic acid sequence is (1), positive in charge; (2), neutral in charge; (3), negative in charge.
5. Protein structure may NOT be denatured by (1), heat; (2), acid; (3), presence of oxygen gas; (4), proteases.
6. DNA sequences can be amplified by (1), CPR, cardiopulmonary resuscitation; (2), PCR, polymerase chain reaction; (3), RCP, reality co-processor.
7. Mitochondria are only inherited from (1), father; (2), mother; (3), both.
8. Which of the following bases is not DNA? (1), guanine; (2), thymine; (3), adenine; (4), uracil; (5), cytosine.
9. Which of the following molecules is responsible for energy transportation? (1), RNA; (2), ATP; (3), DNA; (4), Methane.
10. Which of the following descriptions is wrong? (1), enzymes are proteins; (2), enzymes can be denatured by acid; (3), enzymes are involved in chemical reactions; (4), the shape of enzyme can be reversibly altered by allosteric subunits.
11. Which of the following structures is absent from animal cells? (1), cell membrane; (2), nuclear envelope; (3), cell wall; (4), ribosome.
12. Which of the following descriptions is correct? (1), bacteria are eukaryotic cells; (2), cytoplasm is the region between the nucleus and the plasma membrane in a eukaryotic cell; (3), DNA moves regularly from the nucleus to the cytoplasm; (4), most DNA of a eukaryotic cell is present in the cytoplasm.
13. Which of the following descriptions is wrong? (1), phospholipids are the most abundant lipids in a cell membrane; (2), osmosis refers to the diffusion of water; (3), a membrane is hold together primarily by hydrophobic attractions; (4), increasing the size of molecules will increase the rate of diffusion.
14. The term anaerobic means (1), with oxygen; (2), without oxygen; (3), with nitrogen; (4), without nitrogen.
15. Glycolysis is present in (1), bacteria; (2), fungi; (3), eukaryotic cells; (4), virtually all kinds of cells.
16. In the production of wine, the glucose from fruit is converted by yeast to (1), ethanol; (2), heat; (3), oxygen; (4), DNA.

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共 4 頁第 2 頁

17. Which of the following descriptions about autotroph is NOT true? (1), an autotroph sustains itself without eating other organism; (2), an autotroph gets its carbon from carbon dioxide; (3), mushroom is an autotroph; (4), an autotroph requires energy from light or inorganic chemical reactions to produce complex organic compounds.
18. Which of the following descriptions about photosynthesis is NOT true? (1), photosynthetic autotrophs get their energy from heat; (2), photosynthesis transforms light energy to chemical energy; (3), in plants, chloroplasts are the organelles conducting photosynthesis; (4), Photosynthesis occurs in plants, algae, and many species of bacteria.
19. Comparing to C3 plants, C4 plants are (1), more colorful; (2), more suitable to arid environments; (3), less efficient in using water; (4), taller.
20. Plants store glucose in the form of (1), cellulose; (2), sucrose; (3), fructose; (4), starch.
21. In mitosis, the number of chromosome sets in daughter cells is (1), half; (2), one fourth; (3), twice; (4), the same as the number in the parent cells.
22. If you discovered a creature having a fifth base in addition to G, A, T and C, it might imply that the creature (1), has nothing special; (2), evolves from birds; (3), is an alien since all organisms on earth share the same nucleotides, G, A, T and C; (4), evolves from fish.
23. Which of the following segments is the complementary sequence of GATTCCGAC? (1), GAAAGGTCC; (2), CTAAGGCTG; (3), GATTCCGAC; (4), GATTCCGAC.
24. Which of the following RNA sequences is transcribed from GATTCCGAC? (1), CUAAGGCUG; (2), CTAAGGCTG; (3), GATTCCGAC; (4), GATTCCGAC.
25. After transcription, DNA molecules (1), are wrapped in protein; (2), disintegrate into its component nucleotides; (3), move to the cytoplasm; (4), replicate itself.
26. Polypeptides are assembled on (1), vacuoles; (2), centrosomes; (3), ribosomes; (4), Golgi body.
27. Which of the following descriptions is NOT true? (1), body cells of an animal are different in structure and function because they synthesize different mRNA molecules; (2), there are 64 codons and each of them is composed of 4 nucleotides; (3), all body cells of an animal contain the same genes; (4), there are 23 chromosomes in human sperm cells.
28. Genes that code for polypeptides are called (1), functional genes; (2), structural genes; (3), regulatory genes; (4), optional genes.
29. Viral genomes are made of (1), either DNA or RNA; (2), either protein or fatty acid; (3), RNA; (4), DNA.
30. Which of the following descriptions about viruses is true? (1), the virus that causes AIDS is not a retrovirus; (2), viruses are obligate parasites of cells; (3), genomes of viruses are only made of DNA; (4), viruses have a nucleus.
31. Which of the following descriptions about bacteria is NOT true? (1), bacteria have no nucleus; (2), bacteria cannot acquire new genes by taking up DNA molecules from its surroundings; (3), bacteria are prokaryote; (4), bacteria can transfer genes from one individual to another.

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共 4 頁第 3 頁

32. The blood types of a couple are AB and B, and their daughter has blood type O. Which of the following situations may NOT explain this? (1), her father is someone else; (2), the hospital made a mistake of her blood type; (3), nothing wrong.
33. Scientific names must be in (1), Latin; (2), Taiwanese; (3), Chinese; (4), English.
34. Natural selection acts on (1), genotype; (2), phenotype; (3), holotype; (4), neotype.
35. According to Biological Species Concept, individuals of the same species would be able to interbreed and reproduce (1), sterile offspring; (2), fertile offspring; (3), clones; (4), a new species.
36. Similar traits on distantly related organisms may result from (1), divergent evolution; (2), parallel evolution; (3), convergent evolution; (4), coevolution.
37. The study that describes the evolutionary history of species or other taxonomic ranking is called (1), taxonomy; (2), phylogeny; (3), entomology; (4), ichthyology.
38. Which of the following animals is NOT fish? (1), whale; (2), shark; (3), lamprey; (4), tuna.
39. Which of the following plant tissue is composed of dead cells? (1), xylem; (2), epidermis; (3), ground; (4), phloem.
40. Charles Darwin is great because he proposed the scientific theory of (1), universal gravitation; (2), homeostasis; (3), natural selection; (4), vicariance.
41. Which of the following descriptions is NOT true? (1), a flatworm can receive nutrients and oxygen by diffusion from its environments; (2), homeostasis occurs in all organisms to some extent; (3), gills are the major gas-exchange organ for most aquatic animals; (4), energy is stored in liver and muscle as fat.
42. Marine fish must continuously (1), excrete salt without drinking water; (2), drink water and excrete salt; (3), drink water without excreting salt.
43. A population is (1), a group of organisms of one species living in the same place at the same time; (2), a group of organisms of two species living in the same place at the same time; (3), a group of organisms of several species living in the same place at the same time; (4), a group of organisms of one species living in different places.
44. An animal that maintains its body at a metabolically favorable temperature is (1), a plant; (2), an endotherm; (3), an ectotherm; (4), fish.
45. Symbiosis is divided into three categories. Which of the following terms is NOT included? (1), mutualistic; (2), allopatric; (3), commensal; (4), parasitic.
46. External fertilization occurs almost exclusively in habitats that are (1), arid; (2), moist; (3), warm; (4), cold.
47. Which of the following gases is NOT greenhouse gas? (1), H₂O; (2), CO₂; (3), CH₄; (4), O₂.

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複選題，每題三分。不可於試題紙上作答。

48. Which two of the following cellular organelles can transform energy? (1), mitochondria; (2), chloroplasts; (3), cytosol; (4), lysosome.
49. Which two of the following persons discovered the double helix structure of DNA? (1), Francis Crick; (2), Charles Darwin; (3), James Watson; (4), Confucius.