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國立臺灣大學 112 學年度碩士班招生考試試題

科目： 普通生物學(B)

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Multiple choice: select one best answer from the list of choices (4 points each). ※ 注意：請於試卷內之「非選擇題作答區」標明題號依序作答。

1. "Nematodes are the most likely parasite one may encounter when eating salmon sashimi." The two groups of animals underlined in the sentence above are _____.

- (A) deuterostome and protostome, respectively.
- (B) ecdysozoa and deuterostome, respectively.
- (C) lophotrochozoa and deuterostome, respectively.
- (D) ecdysozoa and protostome, respectively.
- (E) lophotrochozoa and protostome, respectively.

2. Which of the following group is most UNLIKELY to be sold in a seafood market in Taiwan?

- (A) Hexapoda
- (B) Decapoda
- (C) Cnidaria
- (D) Bivalvia
- (E) Echinodermata

3. Among the groups of animals listed below, how many of them are NOT insects?

Beetles (甲蟲); butterflies (蝴蝶); spiders (蜘蛛); millipedes (馬陸); centipedes (蜈蚣); dragonflies (蜻蜓); bees (蜜蜂); pill bugs (鼠婦); scorpions (蠍子); cicada (蟬); locust (蝗蟲).

- (A) 3
- (B) 4
- (C) 5
- (D) 6
- (E) 7
- (F) 8

4. If a turtle and a dragonfly larva both eat the same species of fish, what is the relationship between the turtle and the dragonfly larva?

- (A) predation
- (B) mutualism
- (C) parasitism
- (D) competition

5. The laryngeal nerve is 450 cm long in giraffes because

- (A) a giraffe's throat is located far away from its brain.
- (B) this nerve connects to the spinal cord.
- (C) the nerve is modified from an ancestor that did not have a long neck.
- (D) this nerve is a vestigial organ.

6. Which of the following organisms has a gastrovascular cavity?

- (A) hydra
- (B) earthworm
- (C) clam
- (D) bird

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7. A characteristic of the circulatory system of arthropods is
(A) lack of a heart.
(B) lack of blood.
(C) lack of blood vessels.
(D) lack of distinction between blood and interstitial fluid.
8. Although birds and mammals descended from different ancestors, they both have a four-chambered heart. This is the result of
(A) the simplification of the cardiovascular system.
(B) the necessity for rapid movement of blood.
(C) convergent evolution.
(D) genetic aberrations that resulted from mistakes in somatic cell division.
9. To conserve precious salts, freshwater fish
(A) drink large amounts of water and produce small amounts of urine.
(B) drink almost no water and produce large amounts of dilute urine.
(C) excrete salt ions and small amounts of urine.
(D) consume salt ions in food and eliminate water by osmosis.
10. Which statement about hydrostatic skeletons is TRUE?
(A) Hydrostatic skeletons are nonflexible.
(B) Hydrostatic skeletons provide little support for muscle action.
(C) Hydrostatic skeletons produce rigid animals that maintain one shape.
(D) Hydrostatic skeletons can protect internal organs.
11. Which statement below about animals is TRUE?
(A) Dinosaurs are extinct.
(B) Lungfish are more closely related to human than to salmon.
(C) Vertebrate is a phylum.
(D) Protozoa are primitive animals.
12. You are cleaning out an old lab freezer and find a tube that contains the ground-up remains of an unknown animal. Your research advisor suggests that you perform chemical assays to determine what molecules made up the animal. After analyzing the data, you determine that the animal contained a large amount of chitin. What type of animal was in the tube?
(A) mollusc
(B) reptile
(C) arthropod
(D) annelid
13. DNA viruses differs from RNA viruses in that_____.
(A) only DNA viruses have the genetic materials enveloped by the capsid.
(B) DNA viruses do not bypass transcription during protein synthesis.
(C) DNA viruses are stable due to the higher mutation rate as compared to RNA viruses.
(D) only DNA viruses show the error-prone replication.
(E) DNA viruses contain a smaller genome as compared to RNA viruses.

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14. The three domains of organisms are the
(A) Archaea, Bacteria, and Protista
(B) Bacteria, Eukarya, and Protista
(C) Bacteria, Eukarya, and Fungi
(D) Archaea, Bacteria, and Eukarya
(E) Archaea, Eukarya, and Fungi
15. The nucleus of plant cells most likely evolved from
(A) a chloroplast.
(B) a mitochondrion.
(C) a lysosome.
(D) portions of the plasma membrane.
(E) portions of the vacuole.
16. Prokaryotic flagella differ from eukaryotic flagella in that prokaryotic flagella
(A) are surrounded by a plasma membrane.
(B) consist of microtubules.
(C) consist of subunits of flagellin.
(D) are long, slender appendages.
(E) are involved in motility.
17. The cell walls of gram-positive and gram-negative Bacteria differ in that gram-positive species have cell walls
(A) with less peptidoglycan.
(B) of greater thickness.
(C) consisting of two layers.
(D) with a layer of lipopolysaccharides.
(E) with a structure similar to that of the plasma membrane.
18. Which of the following cells or structures are involved in the asexual reproduction of fungi?
(A) conidia.
(B) ascospores.
(C) basidiospores.
(D) ascocarps.
(E) zygospores.
19. Which of the following statements about algal blooms is FALSE?
(A) they are associated with water disturbed by humans.
(B) they occur when algal growth is unchecked.
(C) some are known as red or brown tides.
(D) the frequency of marine algal blooms has decreased globally.
(E) they are often correlated with the release of toxic compounds.
20. In the land plants, matrotrophy refers to the
(A) attraction of sperm by the egg.
(B) nourishment of the zygote by the archegonium.
(C) transport of sugars through the placenta.

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(D) division of the zygote within the venter.

(E) movement of sugars through plasmodesmata.

21. In the evolution of vascular plants, there is a trend toward the

(A) above-ground parts becoming structurally similar to the below-ground parts.

(B) progressive reduction of the sporophyte.

(C) sporophyte becoming nutritionally dependent on the gametophyte.

(D) increased protection of the gametophyte by the sporophyte.

(E) production of seeds in all lineages.

22. Which of the following statements about gymnosperms is FALSE?

(A) gymnosperm means "naked seed."

(B) ovules and seeds are exposed on the surface of sporophylls.

(C) the female gametophyte produces several archegonia.

(D) the male gametophyte produces several antheridia.

(E) the male gametophyte is endosporic.

23. The most important pigments in floral coloration are _____; the red and orange pigments of flowers are usually _____.

(A) anthocyanins; betacyanins.

(B) tannoids; flavonoids.

(C) flavonoids; carotenoids.

(D) carotenoids; betacyanins.

(E) betacyanins; flavonoids.

24. Ectomycorrhizae differ from endomycorrhizae in that the fungal component of ectomycorrhizae

(A) is usually a zygomycete.

(B) forms arbuscules and vesicles.

(C) is not highly specific for the plant component.

(D) penetrates the cortical cells of the root.

(E) forms a Hartig net and mantle.

25. What are the end products of the light reactions of photosynthesis?

(A) glucose, oxygen.

(B) glucose, NADPH.

(C) ATP.

(D) ATP, NADPH and oxygen.

(E) glucose, ATP and NADH.