Chapter 28 Exercises

Review Questions

1. Mesohyl contains _____.
- **a.** a polysaccharide gel and dead cells
- **b.** a collagen-like gel and suspended cells for various functions
- **c.** spicules composed of silica or calcium carbonate
- **d.** multiple pores

2. The large central opening in the parazoan body is called the _____.
- **a.** gemmule
- **b.** spicule
- **c.** ostia
- **d.** osculum

3. Most sponge body plans are slight variations on a simple tube-within-a-tube design. Which of the following is a key limitation of sponge body plans?
- **a.** Sponges lack the specialized cell types needed to produce more complex body plans.
- **b.** The reliance on osmosis/diffusion requires a design that maximizes the surface-area-to-volume ratio of the sponge.
- **c.** Choanocytes must be protected from the hostile exterior environment.
- **d.** Spongin cannot support heavy bodies.

4. Cnidocytes are found in _____.
- **a.** phylum Porifera
- **b.** phylum Nemertea
- **c.** phylum Nematoda
- **d.** phylum Cnidaria

5. Cubozoans are _____.
- **a.** polyps
- **b.** medusoids
- **c.** polymorphs
- **d.** sponges

6. While collecting specimens, a marine biologist finds a sessile Cnidarian. The medusas that bud from it swim by contracting a ring of muscle in their bells. To which class does this specimen belong?
- **a.** class Hydrozoa
- **b.** class Cubozoa
- **c.** class Scyphozoa
- **d.** class Anthozoa

7. Which group of flatworms are primarily ectoparasites of fish?
- **a.** monogeneans
- **b.** trematodes
- **c.** cestodes
- **d.** turbellarians

8. The rhynchocoel is a _____.
- **a.** circulatory system
- **b.** fluid-filled cavity
- **c.** primitive excretory system
- **d.** proboscis

9. Which of the following is a characteristic of Annelids?
- **a.** pseudocoelom
- **b.** true coelom
- **c.** no coelom
- **d.** none of these

10. A mantle and mantle cavity are present in _____.
- **a.** phylum Echinodermata
- **b.** phylum Adversoidea
- **c.** phylum Mollusca
- **d.** phylum Nemertea

11. How does segmentation enhance annelid locomotion?
- **a.** Segmentation creates repeating body structures so that the entire organism functions in synchrony.
- **b.** Segmentation allows specialization of different body regions.
- **c.** Neural segmentation allows annelids to localize sensations.
- **d.** Muscle contractions can be localized to specific regions of the body to coordinate movement.

12. The embryonic development in nematodes can have up to _____ larval stages.
- **a.** one
- **b.** two
- **c.** three
- **d.** four

13. The nematode cuticle contains _____.
- **a.** glucose
- **b.** skin cells
- **c.** chitin
- **d.** nerve cells

14. Crustaceans are _____.
- **a.** ecdysozoans
- **b.** nematodes
- **c.** arachnids
- **d.** parazoans

15. Flies are _____.
- **a.** chelicerates
- **b.** hexapods
- **c.** arachnids
- **d.** crustaceans

16. Which of the following is *not* a key advantage provided by the exoskeleton of terrestrial arthropods?
- **a.** prevents desiccation
- **b.** protects internal tissue
- **c.** provides mechanical support
- **d.** grows with the arthropod throughout its life

17. Echinoderms have _____.
- **a.** triangular symmetry
- **b.** asymmetry
- **c.** hexagonal symmetry
- **d.** pentaradial symmetry

18. The circulatory fluid in echinoderms is _____.
- **a.** blood
- **b.** mesohyl
- **c.** water
- **d.** saline

19. Which of the following features does *not* distinguish humans as a member of phylum Chordata?
- **a.** Human embryos undergo indeterminate cleavage.
- **b.** A spinal cord runs along an adult human's dorsal side.
- **c.** Human embryos exhibit pharyngeal arches and gill slits.
- **d.** The human coccyx forms from an embryonic tail.

20. The sister taxon of the Chordata is the _____.
- **a.** Mollusca
- **b.** Arthropoda
- **c.** Ambulacraria
- **d.** Rotifera

Critical Thinking Questions

21. Describe the different cell types and their functions in sponges.

22. Describe the feeding mechanism of sponges and identify how it is different from other animals.

23. Explain the function of nematocysts in cnidarians.

24. Compare the structural differences between Porifera and Cnidaria.

25. Compare the differences in sexual reproduction between Porifera and Cubozoans. How does the difference in fertilization provide an evolutionary advantage to the Cubozoans?

26. How does the tapeworm body plan support widespread dissemination of the parasite?

27. Describe the morphology and anatomy of mollusks.

28. What are the anatomical differences between nemertines and mollusks?

29. How does a change in the circulatory system organization support the body designs in cephalopods compared to other mollusks?

30. Describe the features of *Caenorhabditis elegans* that make it a valuable model system for biologists.

31. What are the different ways in which nematodes can reproduce?

32. Why are tardigrades essential to recolonizing habits following destruction or mass extinction?

33. Describe the various superclasses that phylum Arthropoda can be divided into.

34. Compare and contrast the segmentation seen in phylum Annelida with that seen in phylum Arthropoda.

35. How do terrestrial arthropods of the subphylum Hexapoda impact the world's food supply? Provide at least two positive and two negative effects.

36. Describe the different classes of echinoderms using examples.