

Z00512 – ANIMAL DIVERSITY: INVERTEBRATES

FINAL TERM MOST IMPORTANT QUESTIONS

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1. Define lobopodium.

Lobopodia are blunt, cylindrical protrusions that are formed at the leading edge of a variety of cell types, ranging from primary human fibroblasts to Amoeba proteus.

2. Write functions of Malpighian Tubules.

The Malpighian tubules are tubular structures that are free floating in the haemolymph and function as excretory and osmoregulatory organs of insects. These tubules function in the same way as human kidney and share common principles during development.

3. Which animals are included in class Diplopoda?

Millipedes are a group of arthropods that are characterised by having two pairs of jointed legs on most body segments; they are known scientifically as the class Diplopoda, the name derived from this feature.

4. Differentiate between Holometabolous Metamorphosis and Hemimetabolous Metamorphosis.

HOLOMETABOLOUS METAMORPHOSIS

In holometabolous (Gr. holo, whole) metamorphosis, immature are called larvae because they are very different from the adult in body form, behavior, and habitat.

HEMIMETABOLOUS METAMORPHOSIS

Some zoologists use an additional classification for insects that have a series of gradual changes in their development, but whose immature form is much different from the adult form usually due to the presence of gills.

5. What is Trepang?

A kind of edible holothurian, as Holothuria edulis; a sea-slug, sea-cucumber, sea-pudding, or bêche-de-mer; also, such holothurians as a commercial product prepared for food.

6. Write characteristics of phylum Annelida.

- Less than 1mm in length to more than 3m.
- Coelom is present and used as storage for gametes and hydrostatic skeleton for locomotion.
- A closed circulatory system absent in some.
- Protostome characteristics.
- Metanephridia (usually) or protonephridia.
- Brain or cerebral ganglion.

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- Ventral nerve cord.
- Segmental arrangement of body parts.
- Flexible support and efficient locomotion.
- Origin of coelom: Formed by the splitting of mesoderm during embryonic stage.
- Origin of muscles: Develop from mesodermal layer.
- Tagmatization

7. Define book lungs.

A book lung is a type of respiration organ used for atmospheric gas exchange that is found in many arachnids, such as scorpions and spiders.

Function of book lungs:

- Book lungs are not related to the lungs of modern land-dwelling vertebrates.
- Stacks of alternating air pockets and tissue filled with hemolymph give them an appearance similar to a "folded" book.
- The folds maximize the surface exposed to air, and thereby maximize the amount of gas exchanged with the environment.

8. Write short note on synchronous flight mechanism of insects.

Direct or synchronous flight is a mode of transportation that is fueled by wing muscles that insert directly into the wing base. The insertion point of the wing is hinged which enables the muscles downward movements to lift the wing portion upward and upward movements pull the wing portion downward. One drawback to direct flight is that these insects cannot hover in mid-air unless they use wind currents. This does not mean the primitive mechanism is neither obsolete nor hindered.

9. Explain circulatory system of Crayfish.

Circulatory system is open type. Circulation in crustaceans is similar to that of most arthropods. Crustaceans have an open circulatory system consisting of a heart either compact or tubular, and arteries which transport blood to different areas of the haemocoel. Some smaller crustaceans lack a heart. Cirripedes and many ostracods and copepods have no heart, the blood being kept in motion by either a blood pump or rhythmic movements of the body, gut, or appendages.

10. Write note on pollination.

Pollination is a method where pollen grains are picked from an anther, which is the male part of a flower and transferred to the flower's female part called the stigma. To make the pollination work successfully, the pollen grains must be transferred from the same species of flower.

11. Define Ossicles.

Ossicles are small calcareous elements embedded in the dermis of the body wall of echinoderms. They form part of the endoskeleton and provide rigidity and protection. They are found in different forms and arrangements in sea urchins, starfish, brittle stars, sea cucumbers, and crinoids.

12. What is function of Trichocyst?

Trichocysts are pellicular structures primarily used for protection. They are rod-like or oval organelles oriented perpendicular to the plasma membrane. In Paramecium, they have a “golf tee” appearance. The pellicle can discharge trichocysts, which then remain connected to the body by a sticky thread.

13. Define Royal Jelly.

Royal jelly is a honey bee secretion that is used in the nutrition of larvae, as well as adult queens. It is secreted from the glands in the hypopharynx of nurse bees, and fed to all larvae in the colony, regardless of sex or caste.

14. What is ectotherm and heterotherm?

An **ectotherm** is an organism in which internal physiological sources of heat are of relatively small or quite negligible importance in controlling body temperature. Some of these animals live in environments where temperatures are practically constant, as is typical of regions of the abyssal ocean and hence can be regarded as homeothermic ectotherms.

Heterothermy or heterothermia is a physiological term for animals that vary between self-regulating their body temperature, and allowing the surrounding environment to affect it.

15. What is the diet of crayfish?

Crayfish are omnivorous...like most shrimp and lobsters. That means they will eat almost anything. Crayfish eat fish, shrimp, water plants, worms, insects, snails, plankton, and more. They will also eat dead plants and animals.

16. Is Sea Urchin invertebrate? If yes then write the phylum.

Yes, Sea Urchin is an invertebrate. Sea urchins belong to the phylum Echinodermata--the same group as sea stars, sand dollars, sea lilies and sea cucumbers. Although difficult to see through all the spines, sea urchins also have a hard outer body like that of its relatives.

17. Write functions of Cuvierian tubules in sea cucumber?

The peculiar Cuvierian tubules of sea cucumbers function as a defense mechanism. They thwart attacks by creating a sticky network composed of elongated tubules within which the potential predator is entangled in a matter of seconds and thus immobilized.

18. Define mechanism of ventilation in insects.

Insects do not breathe through their mouths as we do. They do not have lungs and their blood, which is a watery, yellowish liquid, does not carry oxygen and carbon dioxide around their bodies. Insects have a system of tubes, called tracheae, instead of lungs. These tracheae penetrate right through the insect's body. Air enters the tracheae by pores called spiracles. These spiracles are found on each side of the insect's abdomen. Each segment of the abdomen has a pair of spiracles.

19. Write the skeleton of Sea Urchins.

Skeleton of Sea Urchin is called Test. No shells are present. Five rows of ambulacral plates and five interambulacral plates are present. Sockets are present to which the spines are attached by ball and socket joints. Primary (long) and secondary (short) spines are also present. Some spines contain venom dangerous to swimmers.

20. What is function of GUT in arachnids?

Arachnids are mostly carnivorous, feeding on the pre-digested bodies of insects and other small animals. Only in the harvestmen and among mites, such as the house dust mite is there ingestion of solid food particles, and thus exposure to internal parasites, although it is not unusual for spiders to eat their own silk. Several groups secrete venom from specialized glands to kill prey or enemies. Several mites and ticks are parasites, some of which are carriers of disease.

Digestive juices:

Arachnids produce digestive juices in their stomachs and use their pedipalps and chelicerae to pour them over their dead prey. The digestive juices rapidly turn the prey into a broth of nutrients, which the arachnid sucks into a pre-buccal cavity located immediately in front of the mouth.

Stomach:

The stomach is tubular in shape, with multiple diverticula. The stomach and its diverticula both produce digestive enzymes and absorb nutrients from the food.

21. Explain locomotion in sea cucumber.

They are sluggish burrowers and creepers. Spines and tube feet help in locomotion. They move by thrashing the arms including a rowing motion. The tube feet perform contraction and expansion of the body. Swimming is known to occur in crinoids, ophiuroids, and holothurians.

22. Explain mating behavior in insects.

Mating behavior:

Mating behavior is typically viewed as comprising all events from pair formation through courtship to the final breakup of the mating pair.

Locating and recognizing mates:

- Chemical attractants
- Humming sound
- Courtship ritual

Mating:

Internal fertilization by insertion of the male intromittent organ into the female genital tract for deposition of sperm is the usual method of copulation.

23. Write body parts of insects.

The three main insect body parts are head, thorax, and abdomen. The head contains the antennae, eyes, and mouthparts. The thorax is the middle body part to which the legs and wings are attached. The abdomen contains digestive and reproductive organs internally and often reproductive structures externally.

24. Define Metamorphosis.

Metamorphosis is the process of development of an organism that involves distinct stages with an abrupt change between them. Metamorphosis is a remarkable process of differentiation. The speed and extent of cell growth and is astonishing. In most species, such rapid growth and such sweeping changes to cell type only happen during embryonic development.

25. Explain Aristotle's lantern.

Conical shaped chewing apparatus projecting from mouth. Complex arrangement of muscles and calcareous teeth constituting about 35 ossicles. Teeth are extruded to scrape algae and other food from rocks. Five strong teeth, 40 skeletal ossicles and 60 muscles. Masticating the food. Feed on algae, bryozoans, coral polyps, and dead animal remnants.

26. Write note on soil dwelling insects.

Weed Killers: So many insects feed upon unwanted weeds just the same manner they do with the cultivated crops.

Scavengers: Insects which feed on dead and decaying matter of plants and animals are called as scavengers.

Aeration and turnover of the soil: As decomposers, insects help create top soil, the nutrient rich layer of soil that helps plants grow.

Promotion of decay process: In many ecosystems millipedes (Diplopoda) have special importance as decomposers.

Role in food chain: Food for other animals: Many insects live on grass and plants for food. Food insects but in-turn they become prey to many birds, amphibians, fishes, lizards, and other animals.

27. Write hemal system in insects.

- Peculiar system of tissues and organs consists of strands of tissues.
- Spongy axial organ.
- Axial sinus, and connects to two hemal rings, one oral and the other aboral.
- Transports nutrients from the coelomic fluid to the gonads.
- Likened to a vestigial circulatory system.
- Circulation in cushion star.

28. Explain strobilation in cnidarians.

In particular, the cnidarian's tentacles tend to be reabsorbed.

Neck-formation: transverse constrictions appear near the upper extremity of the animal. A strobilating polyp is called a strobila while the non-strobilating polyp is called a scyphistoma or scyphopolyp.

29. Write species of Horse Shoe crab.

Chelicerates (Chelicerata) are a group of arthropods that includes harvestmen, scorpions, mites, spiders, horseshoe crabs, sea spiders, and ticks.

30. Explain reproduction in sea star.

The sea star spawns by releasing eggs and sperm into the water, where the eggs are fertilized. Females can release up to 2.5 million eggs. Fertilized eggs develop into free-swimming larvae. After about three weeks, the larvae settle and morph into adults.

31. Write note in insect memory.

Studies over the past century have discovered that many insects, like humans, acquire more than one type of spatial memory, that they acquire these memories at different rates and that, as they become more familiar with an environment, they change which memories they use.

Insects certainly display complex and apparently intelligent behavior. They navigate over long distances, find food, avoid predators, communicate, display courtship, care for their young, and so on. The complexity of their behavioral repertoire is comparable to any mammal.

32. Explain Nervous System of Insects.

The central nervous system consists of a series of ganglia that supply nerves to successive segments of the body. The three main ganglia in the head (protocerebrum, deutocerebrum, and tritocerebrum) commonly are fused to form the brain. The rest of the ganglionic chain lies below the alimentary canal against the ventral body surface. In most insects the number of separate ganglia has been reduced by fusion. The last abdominal ganglion always serves several segments. In homopterans and heteropterans all the abdominal ganglia usually fuse with mesothoracic and metathoracic ganglia.

33. Write note on stomach of Starfish.

A sea star has 2 stomachs, the cardiac stomach and the pyloric stomach. It can push the cardiac stomach out of its mouth, in the centre of its underside, to engulf prey or insert it into prey (between 2 shells, for example). The stomach then secretes a powerful digestive enzyme to break down the prey.

34. What are pheromones?

Pheromones are chemicals used by insects and other animals to communicate with each other. Insects send these chemical signals to help attract mates, warn others of predators, or find food. Using specific pheromones, traps can be used to monitor target pests in agriculture or in residential areas.

Sex pheromones: Excite or attract members of the opposite sex; accelerate or retard sexual maturation.

Caste-regulating pheromones: Used by social insects to control the development of individuals in a colony.

Aggregation pheromones: Produced to attract individuals to feeding or mating sites.

Alarm pheromones: Released to warn other individuals of danger; may cause orientation toward the pheromone source and elicit a subsequent attack or flight from the source.

Trailing pheromones: Laid down by foraging insects to help other members of a colony identify the location and quantity of food found by one member of the colony.

35. Write phylum and class of starfish.

The class Asteroidea belongs to the phylum Echinodermata. As well as the starfish, the echinoderms include sea urchins, sand dollars, brittle and basket stars, sea cucumbers and crinoids.

36. Write scientific name of Human.

Homo sapiens

37. Explain life cycle of spider.

The spider life cycle has three stages of development: egg, spiderling and adult. Depending on the species, spiders can lay up to 3,000 eggs, usually in one or more silk sacs. In some spider species, the female dies after laying the eggs. Others carry the egg sac in the chelicerae or attach it to their spinnerets.

38. How regeneration occurs in starfish?

- Ability to regenerate amputated limbs.
- Ability to regenerate lost arms
- Regrow an entire new limb given time.
- Catch connective tissue.

39. What is dermal branchia?

- External gill-like structures are scattered across their body surface.
- Gas exchange.
- Papulae.
- Cilia beat and ventilate the respiratory surface.
- Outer ectodermal epithelium, gland cells and a small basiepithelial nerve plexus.
- Papulae function as a simple site of respiratory exchange.

40. What is Autotomy?

Autotomy or self-amputation is the behaviour whereby an animal sheds or discards one or more of its own appendages, usually as a self-defense mechanism to elude a predator's grasp or to distract the predator and thereby allow escape. Some animals have the ability to regenerate the lost body part later.

41. What are compound eyes?

Compound eyes are precise instruments, different from vertebrate eyes, yet especially adopt at detecting motion, they can analyze polarized light. The convex corneal surface gives a wide visual field, particularly in stalked eyes where the surface may cover an arc of 200 degrees or more.

42. What are tympanic organs?

Tympanal Membrane: The tympanal membrane (eardrum) is a thinned region of exoskeleton, typically supported by a chitinous and stretched across an air-filled cavity.

Insect's Tympanal Organ: Many hearing insects have a pair of tympanal organs that vibrate when they catch sound waves in the air. As the name hints, these organs catch the sound and vibrate in much the way those tympani.

43. What are cnidocytes?

A cnidocyte is an explosive cell containing one large secretory organelle called a cnidocyst that can deliver a sting to other organisms. The presence of this cell defines the phylum Cnidaria. Cnidae are used to capture prey and as a defense against predators.

44. Why rotifers are called wheel animals?

Rotifers are so named because the circular arrangement of moving cilia (tiny hairlike structures) at the front end resembles a rotating wheel.

45. Write note on Garden Centipedes.

Centipedes are predatory arthropods belonging to the class Chilopoda of the subphylum Myriapoda, an arthropod group which also includes millipedes and other multi-legged creatures. Centipedes are elongated segmented creatures with one pair of legs per body segment.