BSc. Biological Chemistry study programme
State exam Biology of Animals questions (as compiled/collated 12. 12. 2024 – ON)
Students are randomly picking TWO questions.

1) Chemical composition of exoskeletons, including cuticles, in invertebrates. Names of groups of animals, type of structure and compounds.

2) Chemical composition of endoskeletons in invertebrates. Names of groups of animals, type of structure and compounds.

3) Chemical composition and structure of endoskeletons and exoskeletons in vertebrate classes.

4) Occurrence of bioluminiscence and UV glowing in invertebrates. Names of groups of animals, structure, compound, function.

5) Nitrogen excretion compounds (waste metabolites) of invertebrates. Formula, solubility, groups of animals that use it.

6) Nitrogen excretion compounds (waste metabolites) of vertebrates. Formula, solubility, groups of animals that use it.

7) How sharks and bony fishes maintain body density similar to water and other ways of keeping buoyancy.

8) Water loss reduction in terrestrial invertebrates. Names of groups of animals, structures, compounds.

9) Water loss in terrestrial vertebrates: reduction or increase by purpose. Names of groups of animals, , structures, mechanisms.

10) Products of hypoxic metabolism. Names of groups of animals, way and place of life.

11) Silk composition and producers, strength of byssus thread.

12) Cryptobiosis (anhydrobiosis, cryobiosis). Which animals, compounds employed.

13) Way of mating and fertilization in crustaceans including insects.

14) Compare mating and fertilization in sharks (Chondrichthyes), bony fish (Actinopterygii), and frogs (Amphibia). Number and size of progeny.

15) Sperm use and longevity in classes of vertebrates and social insects.

16) Compare Rotifera (Rotatoria) and Acanthocephala. Similarities and differences. Morphology, physiology, way of life.

17) Compare nervous systems of Annelida, Arthropoda and Vertebrata.

18) Differences between Cyclostomata (hagfish and lamprey) and aquatic Gnathostomata. Morphology, behaviour.

19) Mouth structure and function of aquatic (water) vertebrates (including young amphibians but not secondary aquatic such as dolphins). Name the classes, their mouth structure (bones, teeth…), how they bite and swallow.

20) Mouth structure and function of terrestrial (land) vertebrates (including adult amphibians). Name the classes, their mouth structure (bones, teeth…) how the bite and swallow.

21) Main groups of tetrapods and their adaptations for life on dry land.

22) Compare breathing in water in lamprey (Cyclostomata), shark (Chondrichthyes), bony fish (Actinopterygii), and sea turtle (Testudinea).

23) Unique features of animals (Metazoa), including formulas or important compounds.

24) Which animals possess neurotoxins, their composition, formulas, action.

25) Not-neurotoxic defence compounds. Formula, group of animal, how to apply it, effect on predator.

26) Function of tracheae and pseudotracheae. Groups of animals, advantages.

27) Function of gills, one invertebrate and one vertebrate example. Connection to circulation.

28) Eyes and abilities of vision of Arthropoda. Structure, focus, colours.

29) Eyes and abilities of vision of Mollusca. Structure, focus, relation to environment.

30) Common multicellular parasites of people, where they live, what they cause, how to protect against them.

31) Which animals produce slime? Environment, function.

32) Ovoviviparous and viviparous vertebrates, way of nutrition of embryos.

33) Mechanical prey capture and food processing structures in invertebrates.

34) Closed circulatory systems in invertebrates.

35) Motion using flagella in invertebrates. Groups, body size, environment.

36) Cellulose eating invertebrates. Way of digestion, environment, ecological and safety consequences.

37) Parasitic crustaceans, excluding insects – groups, hosts, way of feeding.

38) Gut parasites of vertebrates, way of feeding, source of infection.

39) Defence mechanisms of Echinodermata.

40) Animals with external digestion, their food.

41) Antioxidants and enzymes destroying reactive oxygen species. In which animals they are common and important.

42) Invertebrates advantageous for human health, ways of action.

43) Various animal groups living in a typical south-bohemian fishpond, their ecological role.

44) Various animal groups not kept by humans living in a little dirty south-bohemian flat, their ecological role.

45) Animal groups recommendable as easy kept pets in our homes, their requirements.

46) Microbial diseases of humans transmitted by invertebrates, name several vectors, name the microbes, explain symptoms of disease.

47) Tiny animals (adult<1 mm), their way of life.

48) Animal groups discovered after 1990, their way of life, geographic distribution.

49) Human life threatening invertebrates that are not toxic or transmitting microbes; type of danger.

50) Warning colouration of animals: individual representatives, how to produce colouration, who is the recipient of signal.