

**Meghalaya Board
Class XI
Bio-Zoology
Sample Paper 1 – Solution**

GROUP A

1. No. There cannot be mitosis without DNA replication.
2. The H-zone contains only myosin filaments
3. *Gelidium* - Agar
4. Metaphase is the best stage to study the morphology of chromosomes because the chromosomes are the shortest and thickest at this stage.
5. Synaptic knob
6. Oothecae are the capsules which enclose fertilised eggs.

GROUP – B

7.

Chromatin	Chromosomes
i. It is active in controlling metabolism and other activities of the cell.	i. Chromosomes are meant for the distribution of genetic information to the daughter cells.
ii. Chromatin is observable in the interphase nucleus.	ii. Chromosomes are observable during the M-phase or at nuclear division.
iii. Chromatin is in the form of fine fibrils which run throughout the nucleus.	iii. Chromosomes are in the form of short thick threads or rods.
iv. Replication occurs in the chromatin phase.	iv. Replication cannot occur in the chromosome phase.

Or

- i. Functions of polysaccharides:
 - (a) Starch and glycogen are the storage foods in most of the living organisms.
 - (b) Chitin is the structural carbohydrate of fungal walls and exoskeleton of arthropods.
- ii. Functions of amino acids:
 - (a) Amino acids are building blocks of proteins and enzymes.

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(b) The amino acid glycine provides nitrogen and carbon atoms for the synthesis of protoporphyrin and haeme.

8. Haemocoel is a body cavity or pseudocoel filled with blood. It is found in Arthropods and Molluscs.
9. Intestinal lumen and intestinal epithelial cells.
The enzyme which digests fats is lipase.
The end-products of fat digestion are fatty acids and glycerol.
10. The resting membrane is impermeable to the negatively charged proteins of the axoplasm. An active sodium pump transports three sodium ions to the outside, but two potassium ions come inside.

GROUP – C

11. Significance of meiosis:
- Formation of gametes: Meiosis produces gametes for sexual reproduction.
 - Crossing over: It introduces a new combination of traits or variations.
 - Maintenance of chromosome number: Meiosis reduces the number of chromosomes to half in the gametes so that fertilisation may restore the original diploid number in the zygote.
- 12.
- Arthritis. It is caused by the inflammation of the joints. It is a common disease in old age which includes pain and stiffness in the joints.
 - Sprain. It refers to an injury to a joint capsule which involves stretching or tearing of tendons or ligaments. This condition may often remain for a week or may take more time. Thus, it may become chronic.
 - Osteoporosis. It results from excessive resorption of calcium and phosphorus from the bones and leads to more chances of fractures. The major causes of this disorder are imbalances of hormones (such as calcitonin of thyroid, parathormone of parathyroids and sex hormones) and deficiency of vitamin D.

Or

Cretinism is a disorder caused by the deficiency of thyroid hormone (hypothyroidism) in infants.

Causes:

- Failure of the thyroid gland to secrete thyroxine
- Hyposecretion of thyrotropin-releasing hormone (TRH)

13.

- i. Cockroaches cause damage to household materials such as clothes, purses, shoes etc. They also eat and destroy human food such as bread, fruits, cheese etc.
- ii. They carry harmful germs of diseases such as diarrhoea, cholera, typhoid, tuberculosis etc.
- iii. Many animals such as amphibians (e.g. frogs, toads), lizards and birds eat cockroaches. Thus, they are part of the food chain.

GROUP - D

14. For the formation of oxyhaemoglobin, the factors required such as high pO_2 , low pCO_2 , low concentration of H^+ ions and low temperature are maintained in the alveoli. Hence, the binding of oxygen with haemoglobin at lung surfaces is faster.

Low pO_2 , high pCO_2 , high H^+ ion concentration and high temperature are the factors found in tissues which always favour the dissociation of oxygen.

Or

Characteristic features of phylum Porifera:

- a) Poriferans are marine animals.
- b) They are asymmetrical.
- c) They exhibit cellular level of organisation.
- d) Sponges are hermaphrodite, i.e. eggs and sperms are produced by the same individual.
- e) Sponges show the presence of a water canal system which helps in reproduction and gathering of food from the surrounding water, gas exchange and excretion.
- f) Skeleton is made of spongin fibres or spicules.
- g) Fertilisation in sponges is internal.
- h) Digestion is intracellular.
- i) Special cells called choanocytes are present on the internal lining of the spongocoel.

15. Criteria which form the basis of classification of animal kingdom are

- a) Level of organisation of cells: Some animals show cell-level organisation, some tissue-level and some exhibit organ-level organisation of cells.
- b) Body symmetry: Asymmetrical, bilaterally symmetrical and radially symmetrical.
- c) Nature of coelom: Coelomates, acoelomates and pseudocoelomates.
- d) Presence or absence of notochord: Chordates and non-chordates.
- e) Number of embryonic layers found in animals: Diploblastic and triploblastic conditions.

- 16.** In sexually reproducing fungi, hyphae of two compatible mating types fuse. In some fungi, the fusion of haploid cells immediately forms diploid cells ($2n$), but in some ascomycetes and basidiomycetes, the fusion results in an $n+n$ stage, i.e. single cell with two nuclei. Such a condition of cell is called the dikaryon condition and the stage is known as dikaryophase. The polar nuclei of the cells then fuse, and the cell becomes diploid. Reduction division occurs inside the fruiting bodies resulting in the formation of fungi.