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3 (Sem-2/CBCS) ZOO HC 1

2023

ZOOLOGY

(Honours Core)

Paper : ZOO-HC-2016

(Non-Chordates II : Coelomates)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct option : $1 \times 7 = 7$
- (a) The animals belonging to phylum Onychophora
- (i) have Arthropoda characteristics and thus also considered as a class of Arthropoda
 - (ii) have both annelidan and arthropodan characteristics
 - (iii) have both arthropodan and molluscan characteristics
 - (iv) serve as a connecting link between Annelida and Mollusca

Contd.

- (b) The larva which present only in the members of Gastropods is
- (i) glochidium
 - (ii) bipinnaria
 - (iii) veliger
 - (iv) None of the above
- (c) The excretory units of Annelids are called
- (i) flame cells
 - (ii) nephrostomes
 - (iii) nephridia
 - (iv) uriniferous tubules
- (d) Respiration in Arthropoda takes place by
- (i) trachea
 - (ii) gills
 - (iii) book lungs
 - (iv) All of the above

- (e) Crural glands are a characteristic feature of which group of organisms?
- (i) Onychophorans
 - (ii) Placophorans
 - (iii) Nematodes
 - (iv) None of the above
- (f) Compound eyes in Arthropods comprise from a few to many distinct photoreceptive units, called
- (i) infrared receptors
 - (ii) ommatidia
 - (iii) phaosome
 - (iv) stemmata

(g) Absence of excretory organs, great power of regeneration and exclusively marine animals belong to the phylum

(i) Mollusca

(ii) Echinodermata

(iii) Arthropoda

(iv) Amphibia

2. Very short answer : $2 \times 4 = 8$

(i) Differentiate between Protonephridia and Metanephridia.

(ii) What is swarming behaviour of honey bees?

(iii) Distinguish between cutaneous respiration and branchial respiration.

(iv) What is detorsion?

3. Write short notes on **any three** of the following : $5 \times 3 = 15$

(i) General characteristics of Arthropoda

(ii) Basic theories pertaining to the evolution of coelom

(iii) Evolutionary significance of Onychophora

(iv) Various modes of respiration in Mollusca

(v) Formation of pearl in natural environment

4. (a) What are the general characteristics of Annelida? Discuss the process of excretion takes place in Annelids.

$4 + 6 = 10$

Or

(b) Write the distinctive characters of Mollusca. Classify Mollusca up to class mentioning at least three important characters of each class with example.

4+6=10

5. (a) What do you mean by social organization? Discuss the social behaviour in bees explaining how they communicate with each other.

2+8=10

Or

(b) What is metamorphosis? Write on various types of insect metamorphosis. Discuss on the hormonal control of insect metamorphosis.

2+2+6=10

6. (a) Discuss the water vascular system in Asterozoa with suitable diagram. State the function of water vascular system in Echinoderms.

7+3=10

Or

(b) Explain the phenomenon of torsion in Gastropoda with diagram. Write about its significance.

8+2=10

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3 (Sem-2/CBCS) ZOO HC 2

2023

ZOOLOGY

(Honours Core)

Paper : ZOO-HC-2026

(Cell Biology)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct answer : $1 \times 7 = 7$

(i) The structure associated with the formation of aster during nuclear division is

(a) Endoplasmic reticulum

(b) Centriole

(c) Sphaerosome

(d) Ribosome

Contd.

(ii) Cytoskeleton consists of

- (a) Microtubules
- (b) Microfilaments
- (c) Intermediate filaments
- (d) All of the above

(iii) The unit membrane model of plasma membrane was proposed by

- (a) Nicolson
- (b) Danielli and Davson
- (c) Robertson
- (d) Mitchel

(iv) An octamer of histone proteins associated with DNA forms

- (a) Endosome

(b) Nucleosome

(c) Mesosome

(d) Centromere

(v) Pairing of homologous chromosomes in Prophase-I of meiosis takes place in

- (a) Zygotene
- (b) Pachytene
- (c) Diplotene
- (d) Diakinesis

(vi) Nucleolus is the site for the synthesis of

- (a) DNA
- (b) mRNA
- (c) tRNA
- (d) rRNA

(vii) A molecule acting as a 'second messenger' in biological system is

- (a) cDNA
- (b) cAMP
- (c) tRNA
- (d) hn RNA

2. Answer the following : 2×4=8

- (a) Write the basic difference between active and passive transport.
- (b) Draw the structure of a typical mycoplasma.
- (c) Define nucleoplasmic index.
- (d) Write the difference between euchromatin and heterochromatin.

3. Answer **any three** from the following :

5×3=15

- (a) How do Na^+/K^+ ATPase regulate the balance of Na^+ and K^+ in the cell?
- (b) "Mitochondria is considered as a semi autonomous cell organelle." Justify the statement.
- (c) What is nucleosome? Write its importance in DNA packaging.
- (d) What do you mean by autocrine cell signalling? Draw the outline of major signalling pathways by which extracellular messenger molecules can elicit intracellular responses.
- (e) What is facilitated diffusion? Briefly comment on the glucose transporter as an example of facilitated diffusion.

2+3=5

2+3=5

1+4=5

4. (a) Briefly explain the structure and function of Golgi apparatus. 5+5=10

Or

- (b) Write the difference between rough and smooth endoplasmic reticulum with special reference to the nature of their cytosolic surface. Briefly explain the structure and function of rough endoplasmic reticulum. 2+5+3=10

5. (a) What do you mean by a cell cycle? Describe the role of cyclins and kinases in the transition from G_1 to S and G_2 to M during the process of cell cycle regulation. 3+7=10

Or

- (b) Elucidate the structural composition of microtubules. Write its functional significance with special emphasis on its role in cellular organization and intracellular motility. 5+5=10

6. (a) Describe the structure of nuclear pore complex with proper labelled diagram. 7+3=10

Or

- (b) What is oxidative phosphorylation? Write a note on the mitochondrial electron transport system showing the enzymes and the coenzymes involved in the process. 2+8=10
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