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[This question paper contains 4 printed pages]

Your Roll No. : 2019
Sl. No. of Q. Paper : 2283 IC
Unique Paper Code : 32231201
Name of the Course : **B.Sc. (Hons.)
Zoology**
Name of the Paper : Non-Chordates - II :
Coelomates
Semester : II
Time : 3 Hours **Maximum Marks : 75**

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
 - (b) Attempt any **five** questions including Question **No.1** which is compulsory.
 - (c) Please attempt various parts of a question at one place only.
 - (d) Draw well-labelled diagrams wherever necessary.
1. (a) Define the following terms (any **four**) : 4
- (i) Epitoky
 - (ii) Osphradium

P.T.O.

(iii) Protandry

(iv) Papulae

(v) Cephalization

(b) Match the following :

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Column I**Column II**

1. Botryoidal tissue

(i) *Asterias*

2. Radula

(ii) *Sepia*

3. Pedicellariae

(iii) *Pila*

4. Green gland

(iv) *Pheretima*

5. Setae

(v) *Palaemon*

6. Ink gland

(vi) *Hirudinaria*(c) Differentiate between the following pair of terms (any **four**) :

8

(i) Arachnida and Insecta

(ii) Enterocoel and Schizocoel

(iii) Book gills and Tracheal gills

(iv) Protostomia and Deuterostomia

(v) Ctenidia and Taenidia

(d) State whether the following statements are **true** or **false**. In case of *false*, write the correct statement :

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(i) Haemocoel is a space between the body wall and gut; and is packed with parenchyma cells.

(ii) Termites harbour a large number of *Trichonympha* which help in cellulose digestion.

(iii) Class Cephalopoda includes molluscs without a shell.

(iv) Annelids have an open type of blood vascular system.

(v) Echinoderms are the only eucoelomates having both exoskeleton and endoskeleton.

(e) Give the generic name of the following organisms and classify up to class. Give one characteristic feature of the phylum they belong to :

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(i) Sea cucumber

(ii) Rag worm

(iii) Centipede

(iv) Elephant's tusk shell

2. What is metamorphosis ? With the help of suitable examples explain the different types of metamorphosis in insects and its hormonal control.

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3. (a) Describe the respiratory organs of gastropods. How do they help the animal to lead an amphibious life ?

8

(b) Explain the process of pearl formation in bivalves.

4

3

P.T.O.

4. Describe the excretory organs in Annelids and explain their working. 12
5. Give an account of social life of insects with special reference to honey bees. Add a note on their communication system. 12
6. (a) Discuss the water vascular system in Asteroidea. Add a note on its significance. 8
- (b) Briefly describe the affinities of Onychophorans. 4
7. (a) What is mosaic vision ? Describe the functioning of compound eye of arthropods in different intensities of light. 5
- (b) Give a brief account of tracheal respiration in insects. 7
8. Write short notes on any **three** of the following : $4 \times 3 = 12$
- Torsion in gastropods
 - Affinities of Echinoderms
 - Metamerism
 - Pluteus larva of Echinoderms
 - Evolutionary significance of trochophore larva

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Your Roll No. : 2019

Sl. No. of Q. Paper : 2284 IC

Unique Paper Code : 32231202

Name of the Course : **B.Sc. (Hons.) Zoology**

Name of the Paper : Cell Biology

Semester : II

Time : 3 Hours

Maximum Marks : 75

Instructions for Candidates :

- (a) Write your Roll No. on the top immediately on receipt of this question paper.
- (b) Attempt **five** questions in all.
- (c) Question **No.1** is compulsory.
- (d) Give neat labelled diagrams wherever necessary.
- (e) Attempt all parts of a question together.

1. (a) Define the following :

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- (i) Viroid
- (ii) Heterochromatin
- (iii) Synaptonemal complex

- (iv) Cytoskeleton
 (v) Autophagosome
 (vi) Oxidative phosphorylation
- (b) Differentiate between the following : 10
 (i) Microtubule and Microfilament
 (ii) Exocytosis and Endocytosis
 (iii) Lysosome and Peroxisome
 (iv) Active and Passive transport
 (v) Autocrine and Paracrine signalling
- (c) Expand the following : 5
 (i) MAP
 (ii) MPF
 (iii) GPCR
 (iv) NOR
 (v) Cdk
- (d) Name the following : 3
 (i) A protein forming nuclear lamina
 (ii) Terminal electron acceptor in electron transport chain
 (iii) Suicidal bag of the cell
- (e) Name the scientist(s) associated with : 3
 (i) Discovery of nucleosome
 (ii) Discovery of peroxisome

- (iii) Discovery of prion
2. (a) Draw a well-labelled diagram of Nuclear Pore Complex. 4
 (b) Describe the structure of mitochondria. Explain the topography and function of Electron Transport System. 8
3. (a) Describe nucleosome model of chromatin fiber organization and also explain chromatin packaging in metaphase chromosome. 6
 (b) Discuss the concept of second messenger in intracellular signaling. 6
4. (a) Describe the various phases of cell cycle with their molecular events. 6
 (b) Give an account of various types of cell junctions. 6
5. (a) What are intermediate filaments ? Explain its structure and functions. 7
 (b) Depict the process of meiosis only with the help of labelled diagrams. 5
6. (a) Describe the role of RER and Golgi complex in cell secretion. 7
 (b) Explain the various roles played by lysosomes in cell. 5

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7. Write short notes on any **three** of the following :

$$4 \times 3 = 12$$

- (i) Facilitated transport
- (ii) Chemiosmotic hypothesis
- (iii) Signal hypothesis
- (iv) Function of SER
- (v) Fluid Mosaic model