

2022

Full Marks - 60

Time - 3 hours

The figures in the right-hand margin indicate marks  
Answer *all* questions

**Part-I**

1. Answer the following :

1 × 8

- a) Ceruminous gland are modified \_\_\_ glands.
- b) Vitamin D is synthesized from \_\_\_ during ultraviolet light in mammalian skin.
- c) Based on the shape of centrum birds are \_\_\_ type of vertebra.
- d) Pancreas is \_\_\_ in Origin from embryonic archenteron.
- e) The peculiarity of respiratory, system of birds is occurrence of \_\_\_ besides lungs.
- f) \_\_\_ pours blood into the right atrium from the wall of the heart.

- g) With the disappearance of pronephros the old pronephric duct becomes \_\_\_\_.
- h) A nutritive fan like organ in the lumen of birds eye is called \_\_\_\_.

### Part-II

2. Answer any *eight* of the following : 1½ × 8
- a) Give important functions of vertebrate integument.
  - b) Describe dermal derivatives of vertebrates.
  - c) Describe the significance of branchial basket.
  - d) What are the peyers patches ?
  - e) Which animals has external as well as internal gills and why ?
  - f) Differentiate between internal and external respiration ?
  - g) How does the heart of dipnoi differ from that of teleost ?
  - h) What do you understand by archinephros ?
  - i) Explain functions of crure cerebri.
  - j) Briefly describe the type of teeths in vertebrates.

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### Part-III

3. Write notes on any *eight* of the following :  $2 \times 8$
- a) Keratinization
  - b) Appendicular jaw
  - c) Ruminant stomach
  - d) Air bladder
  - e) Swim bladder
  - f) Truncus arteriosus
  - g) Archinephros
  - h) Renal corpuscles
  - i) Cranial nerves in mammals
  - j) Auditory receptors.

### Part-IV

4. a) Give an account on the derivatives of Integuments of Vertebrates. 6

OR

- b) Discuss the Axial and Appendicular skeletal system of mammal.

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5. a) Compare the digestive system of Aves with mammals and give reasons of their difference. 6

OR

- b) Discuss in brief the accessory respiratory organs in Vertebrates.

6. a) Discuss the evolution of heart and aortic arches in Vertebrates. 6

OR

- b) Explain the evolution of kidney in Vertebrates.

7. a) Give a comparative account of brain in mammals. 6

OR

- b) Discuss in brief on visual and auditory receptors in man.

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1. a) Describe the structure of Virus and discuss its type based on genetic material. 9
- b) Write short notes on the following : 3 × 2
  - i) Difference between prokaryotic and eukaryotic cell
  - ii) Mycoplasma.

OR

- c) Describe the process of active transport across membranes. 9
- d) Write short notes on the following : 3 × 2
  - ii) Facilitated transport
  - iii) Desmosomes.

[ 2. ]

2. a) Describe the structure and function of microtubules. 9
- b) Write short notes on the following : 3 × 2
- i) Function of microfilaments
  - ii) Function of lysosomes.

OR

- c) Describe the structure and function of endoplasmic reticulum. 9
- d) Write short notes on the following : 3 × 2
- ii) Structure of intermediate filament
  - iii) Function of Golgi apparatus.
3. a) Describe the structure of mitochondria and add a note on its function. 9
- b) Write short notes on the following : 3 × 2
- i) Chemi-osmotic hypothesis
  - ii) Mitochondrial DNA.

OR

[ 3 ]

- c) Discuss the biogenesis and function of Peroxisomes. 9
- d) Write short notes on the following : 3 × 2
- ii) Oxysome particles
  - iii) Cytochromes.
4. a) Describe the structure of euchromatin and heterochromatin and their packaging. 9
- b) Write short notes on the following : 3 × 2
- i) Synthesis phase of cell cycle
  - ii) Role of cyclins in cell cycle.

OR

- c) Give an account on meiosis. 9
- d) Write short notes on the following : 3 × 2
- ii) Role of CAMP
  - iii) G-protein-coupled receptors.

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Answer *all* questions

**Part-I**

1. Answer the following : 1 × 8
- a) The glycerol phosphate shuttle functions in \_\_\_\_.
  - b) What is the net gain of ATP during the conversion of glucose to pyruvate ?
  - c) Glycogen synthesis increases in presence of \_\_\_\_ hormone.
  - d) The first product of Glycogenolysis is \_\_\_\_.
  - e) Fatty acids are activated to acyl COA by \_\_\_\_.
  - f) Acetylene COA converted into Malonyl COA in presence of enzyme \_\_\_\_ in fatty acid synthesis.
  - g) Coenzyme Q is involved in Electron Transport as a \_\_\_\_.



- h) The complete oxidation of glucose yields usable energy in the form of \_\_\_\_.

### Part-II

2. Answer any **eight** of the following : 1½×8

- a) What is Anabolism ?
- b) Why ATP is called the energy currency of a cell ?
- c) What is phosphorylation ?
- d) Write the significance of PP pathway.
- e) What is Ketogenesis.
- f) What is the role of Acetyl CO-A carboxylase ?
- g) What is oxydative deamination ?
- h) Describe the regulation of urea cycle.
- i) What is chemiosmotic hypothesis ?
- j) What is the role of complex-I of the respiratory chain.

### Part-III

[ 3 ]

3. Write notes on any *eight* of the following :  $2 \times 8$
- a) Energy yielding phase of glycolysis
  - b) Regulation of TCA cycle
  - c) Cori cycle
  - d) Glycogenesis
  - e) Ketogenesis
  - f) Reactions of urea cycle
  - g) Glucogenic aminoacids
  - h) Omega oxidation
  - i) ATP synthase
  - j) Chemiosmotic hypothesis.

#### Part-IV

4. a) Explain the shuttle mechanisms and add a note on their significance. 6

OR

- b) ATP as "energy currency of cell"-Justify

[ 4 ]

5. a) Describe the sequence reaction and regulation of glycolysis. 6

OR

- b) Give an account on citric acid cycle.

6. a) Explain the  $\beta$ -oxidation of saturated fatty acids. 6

OR

- b) Give an account on urea cycle.

7. a) Explain the Electron Transport system and its significance. 6

OR

- b) What are the major redox players in electron transport chain.

2019

Full Marks - 40

Time - 2 hours

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Answer *all* questions

1. a) What do you mean by research ? Distinguish between research methods and research methodology. 6
- b) Write short notes on the following : 2 × 2
- i) Objectives of research
  - ii) Motivation in research.
- OR
- c) Describe the different types of research, clearly pointing out the difference between Quantitative and Qualitative research. 6
- d) Write short notes on the following : 2 × 2
- i) Criteria of good research
  - ii) Meaning of research.

2. a) What is research design ? Discuss the need and features of good research design. 6

b) Write short notes on the following : 2 × 2

i) Observation and facts

ii) Development of models.

OR

c) Explain the steps how to develop a research plan. 6

d) Write short notes on the following : 2 × 2

i) Sample designs

ii) Experimental designs.

3. a) Describe the mechanism of report writing with reference to technical reports. 6

b) Write short notes on the following : 2 × 2

i) Bibliography

ii) Sampling.

OR

[ 3 ]

- c) Explain methods of data collection briefly 6
- d) Write short notes on the following : 2 × 2
- i) Types of observation
  - ii) Observation schedule.
4. a) What is intellectual Property Rights ? Why are Patents necessary ? 6
- b) Write short notes on the following : 2 × 2
- i) Citation
  - ii) Commercialization.

OR

- c) Describe Plagiarism and how to Prevent Plagiarism. 6
- d) Write short notes on the following : 2 × 2
- i) Acknowledgement
  - ii) Patent law.

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Answer *all* questions

1. a) Give an account on general character of Hemichordata, Urochordata and Cephalochordata. 9
- b) Write short notes on any *two* of the following: 3×2
- i) *Herdmania*
  - ii) Tornaria larva
  - iii) Ascidian tadpole larva.

OR

- c) Discuss the Dipleural concept and the Echinoderm theory of origin of chordates. 9

[ 2 ]

d) Write short notes on any *two* of the following: 3×2

i) General characteristics of chordata

ii) Outline classification of chordata

iii) Regressive changes in Urochordata metamorphosis.

2. a) Describe accessory respiratory organs in pisces. 9

b) Write short notes on any *two* of the following: 3×2

i) General characters of Agnatha

ii) Evolutionary significance of *Dipnoi*

iii) Classification upto order for chondrichthyes.

OR

c) Give an account on parental care in Amphibia. 9



[ 3 ]

- d) Write short notes on any *two* of the following: 3×2
- i) Catadromous migration
  - ii) Parental care in fishes
  - iii) Classification of Amphibia.
3. a) Discuss the general characteristics and classification upto order in reptiles. 9
- b) Write short notes on any *two* of the following: 3×2
- i) Poisonous apparatus in snakes
  - ii) Anatomical adaptations for flight in birds
  - iii) Reptilian characters of *Sphenodon*.

OR

- c) Discuss the general characteristics and classification upto order in Aves. 9

- d) Write short notes on any *two* of the following: 3×2
- i) Causes of migration in birds
  - ii) Avian characters of *Archaeopteryx*
  - iii) Types of migration in birds.
4. a) Write an essay on adaptive radiation with reference to locomotory appendages. 9
- b) Write short notes on any *two* of the following: 3×2
- i) General characters of mammals
  - ii) Classification of mammals upto order
  - iii) Reptilian affinity of Prototheria.
- OR
- c) Discuss the theories pertaining to distribution of animals. 9
- d) Write short notes on any *two* of the following: 3×2
- i) Zoogeographical realms
  - ii) Distribution of vertebrates in different realms
  - iii) Mammalian affinity of Prototheria.