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3 (Sem-4/CBCS) ZOO HC 1

2024

**ZOOLOGY**

(Honours Core)

Paper : ZOO-HC-4016

**(Comparative Anatomy of Vertebrates)**

Full Marks : 60

Time : Three hours

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

1. Choose the correct answer :  $1 \times 7 = 7$
- (a) Hairs and nails are composed mainly of
- (i) collagen
  - (ii) keratin
  - (iii) adipose tissue
  - (iv) cartilage
- (b) Foramen of Panizza is seen in
- (i) crocodile
  - (ii) frog

Contd.

- (iii) fish  
(iv) cow
- (c) Wolffian body is also known as
- (i) pronephros
  - (ii) mesonephros
  - (iii) archinephros
  - (iv) metanephros
- (d) The fifth cranial nerve is
- (i) oculomotor nerve
  - (ii) trochlear nerve
  - (iii) abducens nerve
  - (iv) trigeminal nerve
- (e) Organ of Corti is present within
- (i) scala media
  - (ii) scala vestibuli
  - (iii) scala tympani
  - (iv) None of the above
- (f) Pain receptors are also called as
- (i) mechanoreceptor
  - (ii) Merkel's disc
  - (iii) vomeronasal organ
  - (iv) nociceptors

- (g) Teeth with well-developed roots set in bony sockets in the jaw are called
- (i) acrodont
  - (ii) thecodont
  - (iii) pleurodont
  - (iv) bunodont

2. Write short notes on the following :  $2 \times 4 = 8$
- (a) Uropygial gland of birds
  - (b) Adrenergic and cholinergic receptors
  - (c) Stomach of ruminants
  - (d) Role of integument in thermoregulation
3. Answer the following questions : **(any three)**  
 $5 \times 3 = 15$
- (a) Briefly explain the major components of axial skeleton in mammals.
  - (b) Write a note on the accessory organs of the digestive system.
  - (c) What do you mean by external and internal respiration? Elaborate the structural features of internal or true gills found in adult fishes.  $1 + 4 = 5$
  - (d) Write a note on the structural and functional aspects of rods and cones found in the retina of human eye.  
 $3 + 2 = 5$

(e) Briefly explain the functions of sympathetic and parasympathetic nervous systems.  $3+2=5$

4. (a) What are visceral arches? Give a comparative account of the visceral arches in vertebrates.  $2+8=10$

**Or**

(b) What is the hilum of kidney in mammals? Discuss the comparative structure of kidney in vertebrates with neat labelled diagrams.  $2+8=10$

5. (a) Give a comparative account on the integument of reptiles, birds and mammals with suitable diagrams. 10

**Or**

(b) Write a note on the evolutionary changes in the pattern of heart in vertebrates with appropriate diagrams.

6. (a) What is corpus callosum? Describe the structural features of the brain of a reptile and compare it with that of a mammal.  $2+8=10$

**Or**

(b) What are air sacs? Write a note on the types of air sacs. Mention its functions.  $2+4+4=10$

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3 (Sem-4/CBCS) ZOO HC 2

2024

**ZOOLOGY**

(Honours Core)

Paper : ZOO-HC-4026

**(Animal Physiology : Life Sustaining  
Systems)**

Full Marks : 60

Time : Three hours

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

1. Fill in the blanks : 1×7=7
- (a) The capillary network supplying the Loop of Henle is \_\_\_\_\_.
- (b) The amount of air moving in and out of lungs during each breath is called \_\_\_\_\_.
- (c) Major portion of CO<sub>2</sub> is transported as \_\_\_\_\_ in human body.

Contd.

- (d) Pacemaker of the heart is \_\_\_\_\_.
- (e) The Plasma protein responsible for blood clotting is \_\_\_\_\_.
- (f) Carrier protein SGLT has two binding sites. One is for glucose and another is for \_\_\_\_\_.
- (g) Zymogen cells are found in \_\_\_\_\_.

2. Answer very briefly :  $2 \times 4 = 8$

- (a) What is erythropoiesis?
- (b) What is ECG?
- (c) Define vital capacity.
- (d) What are uricotelic and ureotelic animals?

3. Answer the following : **(any three)**  $5 \times 3 = 15$

- (a) Write a note on respiratory pigments.
- (b) Write the role of ADH in urine formation.
- (c) Write about regulation of heart beat.

- (d) Write on ABO blood grouping.
- (e) Describe in brief about the regulation of acid-base balance.
4. (a) What is heart beat? Discuss the process of conduction of heart beat with a labelled sketch.  $2+8=10$

**Or**

- (b) What do you mean by absorption? Describe the process of absorption of carbohydrates and proteins.

$2+4+4=10$

5. (a) What is glomerular filtrate? Write about the mechanism of urine formation in detail.  $2+8=10$

**Or**

- (b) Describe the structure and functions of a nephron with a labelled sketch. What is Renin-Angiotensin system?

$7+3=10$

6. (a) What is blood? Describe the structure and functions of various components of blood. Add a note on fibrinolytic system.  $2+6+2=10$

**Or**

- (b) What is clotting of blood? Write about the process of clotting of blood.  $2+8=10$

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3 (Sem-4/CBCS) ZOO HC 3

2024

**ZOOLOGY**

(Honours Core)

Paper : ZOO-HC-4036

**(Biochemistry of Metabolic Processes)**

Full Marks : 60

Time : Three hours

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

1. Answer the following questions : 1×7=7
- (a) What are aquaporins ?
  - (b) Which shuttle mechanism is used in the cells of skeletal muscle and brain ?
  - (c) ATP is a coenzyme/isozyme/apoenzyme.  
(Choose the correct option)
  - (d) The major site of gluconeogenesis is \_\_\_\_\_.  
(Fill in the blank)

Contd.

- (e) Palmitic acid is straight chain saturated fatty acid. (True/False)
- (f) Give an example of glucogenic amino acid.
- (g) The inner mitochondrial membrane is impermeable to H<sup>+</sup> ions/OH<sup>+</sup> ions / K<sup>+</sup> ions. (Choose the correct option)

2. Answer the following questions briefly :  
2×4=8

- (a) Differentiate between anabolism and catabolism.
- (b) Define substrate level phosphorylation with example.
- (c) Write the significance of urea cycle.
- (d) Why is acetyl-CoA called as a key metabolite precursor ?

3. Answer the following questions : (any three)  
5×3=15

- (a) What is shuttle system ? Describe the malate aspartate shuttle system.
- (b) Give an account of ketogenesis and its regulation.

- (c) Write elaborately about inhibitors of electron transport system.
- (d) Describe briefly the pathways of formation of glycogen.
- (e) "ATP is the energy currency of the cell." Justify the statement.

4. (a) Describe elaborately the process of glycolysis. Add a note on its regulation.  
8+2=10

**Or**

- (b) Describe the pentose phosphate pathway of carbohydrate metabolism. Mention its significance. 8+2=10

5. (a) Give an account of various steps of Krebs cycle. Why this cycle is called an amphibolic pathway ? 8+2=10

**Or**

- (b) What are various complexes of Electron Transport System (ETS) ? Describe the flow of electron through the complexes with illustration. 4+6=10



6. (a) Describe the process of  $\beta$ -oxidation of saturated fatty acid with even number of carbon atoms along with its energetics.  $8+2=10$

Or

- (b) What is transamination? Describe the mechanism and significance of transamination. How does it differ from deamination?  $1+6+2+1=10$