WEST BENGAL STATE UNIVERSITY

B.Sc. Honours Part-III Examination, 2020

ZOOLOGY

PAPER-ZOOA-VII

Time Allotted: 2 Hours | Full Marks: 50

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

1. Answer any ***five*** questions from the following: 2×5 = 10

   (a) Define ram ventilation.
   (b) Compare osmoregulators with osmoconformers.
   (c) What is double staining?
   (d) Distinguish between holocrine and merocrine secretion.
   (e) State the location and function of podocytes.
   (f) What is TMAO? Mention its role in osmoregulation.
   (g) Differentiate between desmosome and hemidesmosome.
   (h) Mention the source and function of PTH.
   (i) Elucidate the causes of Cushing's disease.
   (j) How bioluminescence differs from chemiluminescence?

2. Answer any ***one*** question from the following: 5×1 = 5

   (a) What is Donnan membrane equilibrium? State the mechanism of its generation and its significance. 1+2+2
   (b) Make a comparison of isometric, isotonic and isokinetic muscle contraction. What is a triad? 3+2
   (c) What is action potential? Describe the ionic basis of resting membrane potential. 2+3
   (d) What is ARO? Give an account of ARO in any two fishes. 1+4
   (e) Give a brief account of mechanistic pathway of bioluminescence in animals. Write an example, each from aquatic and terrestrial organism, showing bioluminescence. 3+2

3. Answer any ***one*** question from the following: 10×1 = 10

   (a) Explain the role of PCT, DCT and Loop of Henle in urine formation in human kidney. State the functions of renin-angiotensin-aldosterone system in tubular reabsorption. 6+4
   (b) What is tonicity? Define isotonic, hypotonic and hypertonic solutions. Explain the mechanism of osmoregulation in marine teleost with diagram. 1+3+6

(c) Distinguish between skeletal and smooth muscle. Describe the molecular mechanism of sliding filament theory of muscle contraction. What is muscle twitch? 3+6+1

(d) Briefly explain the structure of neuromuscular junction with a labelled diagram. Discuss the saltatory mode of impulse transmission with suitable diagram. 5+5

4. Answer any ***one*** question from the following: 5×1 = 5

(a) Mention the source and function of Calcitonin. 2+3

(b) Describe a mature graafian follicle with a labelled diagram. 3+2

(c) Classify vertebrate hormones based on their chemical nature and mechanism of action with suitable examples. 3+2

(d) Discuss how ionized Ca^{2+} serves as an intracellular messenger in hormone action. 5

(e) Establish the feedback control mechanism in TSH-Thyroxine axis. 5

5. Answer any ***one*** question from the following: 10×1 = 10

(a) Differentiate between estrous cycle and menstrual cycle. Describe the physiological functions of insulin and testosterone. 4+3+3

(b) Discuss the biosynthesis of Thyroid hormones. Distinguish between hypo and hyperthyroidism. 6+4

(c) Explain autocrine, paracrine and neurocrine types of hormone delivery system with suitable diagram. Describe the role of IP_3-DAG as second messenger. 6+4

(d) What are catecholamines? Discuss briefly the steps involved in the biosynthesis of aldosterone. Elucidate the causes and symptoms of Myxoedema and Cretinism. $1+4+2\frac{1}{2}+2\frac{1}{2}$

6. Answer any ***two*** questions from the following: 5×2 = 10

(a) Describe the histological structure of mammalian seminiferous tubule with labelled diagram. 3+2

(b) What do you mean by cross-linking fixative? Distinguish between dye and stain. Mention the source of hematoxylin. 2+2+1

(c) Describe different types of simple epithelial tissues with diagram and occurrence. 3+2

(d) Discuss the types and functions of neuroglia. What is gap junction? How does it differ from tight junction? 3+1+1

(e) Describe the histological structure of a lymph node with diagram. Comment on its function. 2+1+2

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