

**2016**

**M.Sc. 1st Semester Examination**

**ZOOLOGY**

**PAPER—ZOO-103**

*Full Marks : 40*

*Time : 2 Hours*

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary.*

**Use separate Answer-scripts for Group-A & Group-B**

**Group—A**

*(Animal Physiology)*

1. Answer any *two* questions of the following : 2×2
- (a) What do you mean by oxygen dissociation curve and Bohr effect ? 1+1
- (b) What do you mean by frank-starling mechanism ? 2

*(Turn Over)*

- (c) What is BMR ? Name a factor influencing its value. 1+1
- (d) State the types of Hyposcia. 2
2. Answer any *two* of the following : 4×2
- (a) Briefly describe the properties of Oxyhaemoglobin and Myoglobin. 2+2
- (b) Explain the roles of Vit D in human body. Name the fat soluble vitamins. 2+2
- (c) Define countercurrent cooling mechanisms with proper diagram. 2+2
- (d) Explain the principles of ECG. Draw the phases of cardiac cycle through an ECG. 2+2
3. Answer any *one* of the following : 8×1
- (a) (i) With proper diagram explain the neural regulation of excitation and conduction in heart. 2+4
- (ii) State any two physiological roles of Na. 2
- (b) (i) Describe why Diving problems occur in mammals. write a note on Caisson's disease. 2+3
- (ii) What are Shivering and Brown fat metabolism ?
- $1\frac{1}{2} + 1\frac{1}{2}$

**Group—B**

*(Biotechnology & Techniques and Bioinstrumentation)*

4. Answer any *two* of the following : 2×2
- (a) A circular DN4 of size 3163 bp is digested with a hexacutter. How many fragments would be obtained ?
  - (b) Write the principle of SDS-PAGE.
  - (c) What is cell fractionation ? How it is used in cell biology ?
  - (d) Write the basic principle and application of cryopreservation.
5. Answer any *two* questions of the following : 4×2
- (a) Write a brief note on blue white screening.
  - (b) What is bioremediation ? Highlight the factors responsible for biodegradation.
  - (c) What are the features of Shuttle Vector ? Give example.
  - (d) Write the principle and application of flow cytometry in cell cycle analysis. 2+2
6. Answer *one* question of the following : 8×1
- (a) (i) Write the composition and function of tracking dye in electrophoresis.
  - (ii) Discuss in brief about different types of phytoremediation process.
  - (iii) Add a note on oil eating bug or super bug. 2+3+3

- (b) You are studying a circular plasmid DNA molecule of size 10.5 Kb. When you digest this plasmid with restriction endonucleases BamHI, EcoRI, Hind III singly and in all possible combinations, you obtain linear restriction fragments of the following size.

<u>Enzymes</u>	<u>Fragment Sizes (in Kb)</u>
Bam HI	7.3, 3.2
Eco RI	10.5
Hind III	5.1, 3.4, 2.0
Bam HI + Eco RI	6.7, 3.2, 0.6
Bam HI + Hind III	4.6, 2.7, 2.0, 0.7, 0.5
Eco RI + Hind III	4.0, 3.4, 2.0, 1.1
Bam HI + Eco RI + Hind III	4.0, 2.7, 2.0, 0.7, 0.6, 0.5

Draw a restriction map for the plasmid that fits your data.

---