2017

M.Sc.

1st Semester Examination

ZOOLOGY

PAPER—ZOO-103

Subject Code—35

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 are the essential functions of phosphorus in living system ?

(b) Compare the affinity of Myoglobin and Haemoglobin with oxygen.

(c) Define MABP. Name the factors that influence MABP.

(d) How cardiac output is related to virus return on heart rate ?

2. Answer any *two* questions of the following : 2×4

(a) Describe in details about Vitamin-A with regard to : RDA ; source ; precursors ; deficiency and metabolic functions. $(\frac{1}{2}\times4)+2$

(b) What causes Decompression sickness in humen ? Elaborate the physiological adaptations undertaken by diving mammals to cope with hypoxia 1+3

(c) Schematically represent the sequential steps of Haemostasis. 4

(d) Define homeothermic and poikilothermic animal. Describe the role of hypothalamus in regulation of body temperature.

3. Answer any *one* question of the following : 8×1

(a) (i) Graphically represent the pressure changes during blood flow from left ventricle to venules.

(ii) Describe the histological differences among various types of vessels involved in circulation. 3+5

(b) (i) Represent the redistribution of Blood flow from Rest to maximum exercise.

(ii) Draw the intrinsic conduction system of heart. Summarize the extrinsic neural mechanisms controlling the heart function. 3+(2+3)

Group—B

(Biotechnology and Techniques and Bioinstrumentation)

4. Answer any *two* question of the following : 2×2

(a) What is the advantage of using Shuttle Vector over Cosmid Vector ?

(b) How do Ammonium Per sulphate (APS) and TEMED help in Polymerisation of an acrylamide gel ?

(c) What advantages are there to using a DNA polymerase for PCR that has Proofreading activity, though Taq Polymerase which is commonly used for PCR is a thermostable DNA Polymerase without Proofreading activity.

(d) Point out different factors which are responsible for biodegradation process.

5. Answer any *two* questions of the following : 2×4

(a) Draw and describe the characteristic feature of p-bluescript vector.

(b) What is cell fractionation ? State in brief about different methods of cell fractionation.

(c) What different types of DNA markers are used in DNA finger printing ? How is it used in forensic science laboratories ?

(d) State the principle and application of Affinity Chromatography in Protein Purification.

6. Answer any *one* question of the following : 1×8

(a) (i) Write the principle and application of Agarose gel electrophoresis.

(ii) What is Bioremediation ? Discuss in brief about in-situ and ex-situ bioremediation process.

(iii) Enlist different microbial Biofertilizer. 2+4+2

(b) A piece of DNA (5000 bp long) is digested with RE A and B, singly and together. The DNA fragments produced are separated by gel electrophoresis and their sizes are calculated with the following results :

Digested with		
A	B	A + B
2100 bp	2500 bp	1900 bp
1400 bp	1300 bp	1000 bp
1000 bp	1200 bp	800 bp
500 bp		600 bp
		500 bp
		200 bp

Each A fragment is extracted from the gel and digested with enzyme B and each B fragment is extracted from the gel and digested with enzyme A. The size of the

resulting DNA fragments are determined by gel electrophoresis.

A fragment		fragments produced by digestion with B	B fragment		fragments produced by digestion with A
2100	→	1900, 200	2500	→	1900, 600
1400	→	800, 600	1300	→	800, 500
1000	→	1000	1200	→	1000, 200
500	→	500			

Construct a restriction map of 5000 bp DNA fragment.