2012

M.Sc.

3rd Semester Examination

ZOOLOGY

PAPER—ZOO-302

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Group—A

(*Biotechnology*)

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

(a) Distinguish between Type I and Type II restriction enzymes with example.

(b) What are the optimum physico-chemical parameters for microbial degradation ?

(c) How a pH sensor works in a Probe ?

(d) Mention the criteria for the selection of suitable species on Vermitechnology.

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

(a) What type of chemical bond does a restriction enzyme cleave ? What is a C DNA ? In eukaryotes, how would C DNA differ from genomic DNA ? 1+1+2

(b) Define biomagnification with example. Write notes on oil eating bug or superbug. 1+3

(c) (i) Diagrammatically represent different parts of a biosensor.

(ii) Name two biomarkers for heart blockage. 3+1

(d) Enumerate the role of Cryopreservation in biodiversity conservation. 4

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

(a) (i) Suppose you have cloned a eukaryotic C DNA and want to express the protein it encodes in *E.coli.* What type of vector would you use and what features should this vector have ? Give diagram.

(ii) Suppose you wanted to produce human insulin (a peptide hormone) by cloning. Assume that you could do this by inserting the human insulin gene into a bacterial host where given the appropriate condition, human gene would be transcribed and then translated into human insulin. Which would be better to use as your source of this gene : human insulin DNA or a C DNA copy of this gene ? Explain your choice. 5+3

(b) What is bioremediation? Briefly describe different types of Phytoremediation process. Mention the name of two enzymes responsible for biodegradation. 2+5+1

Group—B

(*Biochemistry*)

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

(a) What is proton motive force?

(b) Explain transitional state of enzyme action.

(c) What is redox-potential?

(d) What is transdeamination?

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

(a) Illustrate different types of Enzyme inhibitions with the help of double reciprocal plot.

(b) Write notes on Ubiquinone and cytochrome. 2+2

(c) Illustrate the mechanism of electron transfer in Complex-I of multienzyme complex in mitochondria.

(d) What is difference between secondary and tertiary folding occurring in protein conformations. Give examples of both. 2+2

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

(a) What is Line-Weaver Bank equation? Exemplified detail mechanism of acylation and deacylation phase in chymotrypsin mediated hydrolysis. 2+6

(b) Answer *two* questions from the following : 4×2

(i) State the salient features of four types of secondary bonds present in proteins.

(ii) Write notes on deamination.

(iii) Write briefly on glycogen primer.

(iv) Mention the significance of Pentose phosphate pathway.