2013

ZOOLOGY (Honours)

Third Paper

Full Marks : 90 Time : Four Hours

The figures in the margin indicate full marks.

Group - A

(Cell-Biology and Histology)

1. Answer any *four* questions : 2×4=8

   (a) What is Svedberg unit ?

   (b) Define cell line.

   (c) Distinguish between benign and malignant tumor.

   (d) Distinguish between phagocytosis and pinocytosis.

   (e) Give the sources of Haematosylin and Carmine.

   (f) Give differences between dye and stain.

2. Answer any *four* questions : 4×4=16

   (a) "Mitochondrial enzymes are highly compartmentalized"— discuss.

   (b) List some generalized functions of cytoskeleton.

   (c) Write a note on the function of Na^+ K^+-ATPase.

P.T.O.

(d) Give the ionic basis of resting membrane potential. How resting membrane potential is mentioned ?

(e) Give a note on endocytic pathways with the help of suitable diagrammatic display.

(f) Give a note on the chemical basis of staining.

3. Answer any *two* questions : 10½×2=21

(a) Explain the role of cytoplasmic determinants in cell differentiation. Write a note on molecular mechanism of cell differentiation. 4+6½=10½

(b) Write the name of two proto-oncogenes of human. What role the proto-oncogenes play ? Describe the mechanisms by which normal cellular proto-oncogenes can be converted to cellular oncogenes. 2+2½+6=10½

(c) Distinguish between the receptor of a protinhormone and a steroid hormone. Describe the mechanism of action of a steroid hormone. 2½+8=10½

(d) Discuss on different types of fixatives used in histology. State the principles of fixation. 7½+3=10½

Group - B

(Genetics and Immunology)

4. Answer any *four* of the following : 2×4=8

(a) What is plasmid ? Give an example.

(b) What are the criteria for Law of segregation ?

(c) What is maternal effect ?

(d) Parental blood group is AB and A, is there any possibility of getting 'O' blood group's child ?

(e) Mention the functions of NK cells.

(f) What is hypervariable region ?

5. Answer any *four* questions : 4×4=16

(a) Write a note on causes and effects of Turner's syndrome.

(b) Write a short note on primary and secondary non-disjunction.

(c) What is complement system ? Explain in short.

(d) Prove that crossing over occur at four-strand stage.

(e) Describe extra nuclear inheritance-taking the example of Kappa Particle.

(f) Write a short note on immunological memory.

6. Answer any *two* of the following : 10½×2=21

(a) Distinguish between paracentric and pericentric inversion. Discuss how inversion causes chromosomal mutation. 2½+8=10½

(b) Assume that in *Drosophila* there are three pairs of alleles, +/x, +/y and +/z. As shown by

symbols, each mutant gene is recessive to it's wild type allele. A cross between female heterozygotes at these three loci and wild-type males yielded the following progeny.

Female	+++	—	1010
	+++	—	39
	++z	—	430
	+yz	—	32
	x++	—	27
	xy+	—	441
	xyz	—	31
			2010

Draw the appropriate linkage map for these data showing the order of the three markers and the map distances for each marked interval. Calculate the coefficient of coincidence for these data. 3½+4½+2½=10½

(c) What are cytokines ? Write about general structures and properties of cytokines ? Explain in short the function of cytokines. 2+6+2½=10½

(d) What are different immunoglobulin domain ? Describe with suitable diagram how does a typical antibody function in terms of variable and constant domains. 2½+8=10½

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Fourth Paper

Full Marks : 90 Time : Four Hours

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Group - A

(Ecology)

1. Answer any *four* questions : 2×4=8

   (a) What is ecotype ?

   (b) Define carrying capacity.

   (c) What do you mean by edge effect ?

   (d) What is social parasite ?

   (e) What is stenothermy ? Give example.

   (f) Define denitrification. Give an example of a bacterium.

2. Answer any *four* questions : 4×4=16

   (a) Explain the Lotka-Voltera equation of predation.

   (b) Explain Cyclomorphosis.

   (c) Give a diagrammatic representation of Nitrogen cycle.

   (d) Mention the monoclymex and polyclymex theory of ecological succession.

P.T.O.

(e) Write a note on potential and realised natality.

(f) Describe the biological characteristics of Tundra Biome.

3. Answer any *two* questions :

(a) What is succession ? Discuss the mode of succession in an area of Sand dunes. 1½+9=10½

(b) Define ecological pyramid. Classify it with proper examples. What do you mean by inverted pyramid ? When is it found ? Why energy pyramid is more realistic than others ? 1½+3+1+2+3=10½

(c) Describe the 'Y'-shaped model of energy flow in an ecosystem. Why is this model realistic than Box-pipe model of energy flow ? Why energy flow is unidirectional ? 7+2+1½=10½

(d) Explain habitat niche trophic niche and hypervolume niche with suitable examples. What is niche width ? 3+3+3+1½=10½

Group - B

(Zoogeography, Wildlife and Biodiversity)

4. Answer any *four* questions : 2×4=8

(a) What is 'living fossil' ? Give an example.

(b) Which geological period is considered as the 'age of fish' and why ?

(c) Name two characteristics mammalian representatives of oriental Realm.

(d) Define continental drift.

(e) Write role of CBD and ICBP in wild life conservation.

(f) What do you mean by endangered species ?

5. Answer any *four* questions : 4×4=16

(a) Name the different types of fossils and comment on how petrified fossils are formed.

(b) What is the significance of study of Zoogeography ?

(c) Define and explain the continuous and discontinuous distribution of animals and cite examples.

(d) Differentiate α-diversity, β-diversity and γ-diversity.

(e) How National Park differs from Wild Life Sanctuary ?

(f) Write a short note on biological magnification.

6. Answer any *two* questions :

(a) What is geological time scale ? Discuss the important developments in faunal evolution during each 'era' of the geological time sacle.

1½+9=10½

P.T.O.

(b) What do you understand by barriers of animal distribution ? Discuss how geographical barriers limit the expansion of animal territory.

2½+8=10½

(c) Mention the location and faunal composition of any one Megadiversity zone in India. 10½

(d) How conservation differs from management ? State briefly the causes of depletion of Wildlife in India. Discuss briefly the conservation strategies of Wildlife. 2+4+4½=10½
