2017

M.Sc.

3rd Semester Examination

ZOOLOGY

PAPER—ZOO-304

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.

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

Group-A

(Genetics (CBCS)

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

(a) Show whether the population of L^ML^M406, L^ML^N744 and L^NL^N 332 in Hardy-Weinberg equilibrium.

(b) What is Barr body and what is its significance.

(c) How many linkage groups are there in Drosophila melangaster ?

(d) Distiguish between F^+ and Hfr strain in *E-coli.*

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

(a) A normal woman whose mother was colorblind has a son. Nothing is known of the color-vision phenotype of the father. What is the probability that the son will be colorblind ?

(b) A streptomycin-sensitive Hfr strain of E.Coli of genotype $a^+b^+c^+d^+e^+$ was mated with a streptomycin-resistant F^- strain of genotype $a^-b^-c^-d^-e^-$ for a period of 30 minutes after which the mating mixture was plated on a medium containing streptomycin. Bacteria of the e^+ type were then selected from the surviving calories, and the following frequencies of other + genes were found

70% were a+

No b+ bacteria were found

85% were c+

10% were d+

What are the relative position of the four genes a, b, c, d in respect to the origin of donor chromosome.

(c) How can you prove that gene transfer in E.Coli is unidirectional not reciprocal ?

(d) Make a complete linkage map from the table showing accompanying markers in specific P1 transductors

Expt	*Selected markers*	*Unselected markers*
1.	leu^+	50% azir 2% thr^+
2.	thr^+	3% leu^+ 0% azir
3.	len^+ and thr^+	0% azir

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

(a) Using the technique of the interrupted mating, five Hfr strains were tested for the sequence in which they transmitted nine different gene markers (F, G, O, P, Q, R, S, W, X, Y) to an F^- strain.

	Hfr Stranis				
Order of transmission ↑	1	2	3	4	5
	Q	Y	R	O	Q
	S	G	S	P	W
	R	F	Q	R	X
	P	O	W	S	Y
	O	P	X	Q	G
	F	R	Y	W	F

What is the gene sequence in the original strain from which these Hfr strains derived ?

(b) In the tomato the nutant genes O (oblate), p (peach) and s (compound influorescene) were found to be in chromosome 2. From the following data (testcross mating of an F_1 heterozygate for all three genes X homogygous recessive for all three genes) determine :

(i) The sephance of the three genes

(ii) The genotypes of the homozygous parents used in making F_1 heterozygote.

(iii) The coefficient of coincidence

Phenotypes of Tescross Progeny	*Number*
+++	73
++s	348
+p+	2
+ps	96
o++	110
o+s	2
op+	306
ops	63

Group-B

(Haematology)

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

(a) How you calculate the "Mean Corpuscular Haemoglobin (MCH)" of blood ? 2

(b) Mention the name of Haemopoetic tissues in invertebrate animals. 2

(c) Write a short note on : Thymus gland of vertebrate. 2

(d) How is anemia diagnosed ? 2

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

(a) How you prepair a perfect blood film in biochemical laboratory ? 4

(b) Mention possible stages and factors involved in the evolution of blood cells and the immune system. 4

(c) How erythrocyte differentiation occur within the bone marrow of mammalian species ?

(d) Is Leukemia hereditary ? Mention Four distinct causes of the said disease concern.

5. Answer any *one* question from the following : 1× 8

(a) State the physical and chemical characteristics of platelets. How blood coagulate occurs within the haemopoletic tissues in human ? 4

(b) Write short notes (any *four*) of the following : 4×2

(i) Platelet ping

(ii) Types of Anemia

(iii) Enythropoiesis-stimulating agent (ESA)

(iv) Clotting factors

(v) Insect haemolymph cells

(vi) Thrombophilic disorder.

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