M.Sc. 3rd Semester Examination, 2019

ZOOLOGY

PAPER —ZOO-304

Full Marks : 40

Time : 2 hours

Answer **all** questions

The figures in the right-hand margin indicate marks

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

Illustrate the answers wherever necessary

Write the answers to Questions of each Group in separate books

GROUP – A

(Genetics)

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

2 × 2

   (*a*) Name two human syndrome which are caused by chromosomal non-disjunction.

(b) What do you mean by "Null Hypothesis" and "Alternative Hypothesis".

(c) Cite two examples where Mendelian Laws are not followed.

(d) What are the characteristics of autosomal dominant trait in human Pedigree.

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

4×2

(a) Predict that the given population is in Hardy-Weinberg equilibrium or not ? It not how many generation needed to reach HWE. MM200 MN300 NN100.

(b) Make a chisquare calculations for the hypothesis that the observation of 30 Tall and 20 short plant arises from a cross between a tall heterozygote and short homozygote, which would ideally produce a ratio of 1/2 tall : 1/2 short.

(c) What phenotypes and ratios would you

expect among the offspring of the following crosses

(i) $l^A l^A \times ii$

(ii) $l^A l^A \times l^A l^B$

(iii) $l^A i \times l^A i$

(iv) $I^A i \times ii$

(d) The following pedigree of individuals affected with muscular dystrophy(shaded) was produced from matings between a particular woman and two different men in two separate marriages. Assuming that the gene is completely penetrant, describe the kind of gene you think is responsible for this defect. (dominant recessive, sex linked, autosomal) and give reasons.
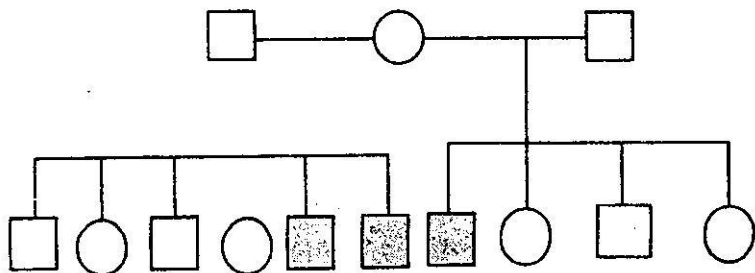
3. Answer any *one* question from the following :

8 × 1

(a) In the tomato the mutant gene o(oblate = flattened fruit), p(peach = hairy fruit) and s(compound infloro scence) were found in chromosome 2. From the following data (test cross mating of an F_1 heterogygote for all three genes X homozygous recessive for all three genes) determine (*i*) the sequence of the three genes (*ii*) The recombination distance between the genes (*iii*) The coefficient of coincidence.

Phenotypes of Test cross progeny	Number
+++	73
++s	348
+p+	2
+ps	96
o++	110
o+s	2
op+	306
ops	63

(Continued)

(b) In a three point test cross $\dfrac{ABC}{abc} \times \dfrac{abc}{abc}$ following data were obtained (only phenotypes are given) :

ABC	abc	aBc	Abc	ABc	abC	aBC	Abc	Total
230	240	96	104	138	142	12	8	970

Find out the correct linear order of the genes. Calculate the map distance between the genes and coefficient of co-incidence.

GROUP – B

(*Haematology*)

4. Answer any *two* questions from the following :

2 × 2

(a) What do you mean by TC and DC of a patient ?

(b) Name the marker enzymes of neutrophil and eosinophil.

(c) How you differentiate the blood smear of fish from human blood film under LM(light microscope).

(*Turn Over*)

(d) Write a short note on :

Histological section (TS) of vertebrate spleen.

5. Answer any *two* questions from the following :

4 × 2

(a) How you determine the 'Haemoglobin-percentage' in a pathology Laboratory ?

(b) State the Histological structure of 'Thymus'-gland and its function in vertebrate animal.

(c) Discuss the light microscopic(LM) mature of haemolymph cells in an insect.

(d) How 'ABO-blood' Group are classify on the basis of (Ag-Ab)-reaction ?

6. Answer any *one* question from the following :

8 × 1

(a) Briefly explain the mechanism of Blood coagulation process with the help of a short scheme.   8

(*Continued*)

(*b*) State the different steps of vertebrate blood film preparation in a pathological Laboratory. Write a note on : 'Anticoagulants'. 6 + 2

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