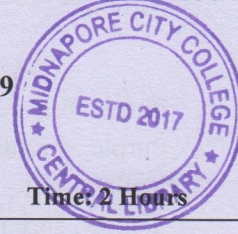


**PG CBCS**  
**M.Sc. Semester-III Examination-2019**  
**ZOOLOGY**  
**Paper Code: C-ZOO 304 (CBCS)**



Full Marks : 40

Time: 2 Hours

Write the answer for each unit in separate sheet

GROUP -A  
 (Genetics)

1) Answer any two of the following :

2×2=4

- a) In humans, Rh-positive individuals have the Rh antigen on their red blood cells, while Rh-negative individuals do not. Assume that a dominant gene Rh produces the Rh-positive phenotype, and the Rh-negative phenotype produces by its recessive allele rh. In a population that is in Hardy-Weinberg equilibrium, if 160 out of 200 individuals are Rh-positive, what are the frequencies of the Rh allele and the rh allele at this locus?
- b) What is Gynandromorph?
- c) What do you mean by degeneracy of the genetic code?
- d) How does the pedigree of an autosomal recessive trait differ from the pedigree of an X-linked recessive trait?

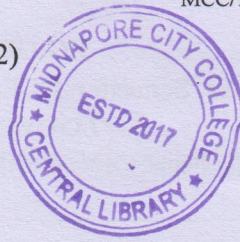
2) Answer any two of the following:

4×2=8

- a) Red-green color blindness in humans is due to an X-linked recessive gene. A woman whose father is color blind possesses one eye with normal color vision and one eye with color blindness. (i) Propose an explanation for this woman's vision pattern. Assume that no new mutations have spontaneously arisen. (ii) Would it be possible for a man to have one eye with normal color vision and one eye with color blindness?
- b) When two parents heterozygous for albinism ( $Aa \times Aa$ ), what will be the probability of this couple having 5 children, two with albinism & three with normal pigmentation?
- c) In corn, purple kernels are dominant over yellow kernels & full kernels are dominant over shrunken kernels. A corn plant having purple & full kernels is crossed with a plant having yellow & shrunken kernels & the following progeny are obtained ----

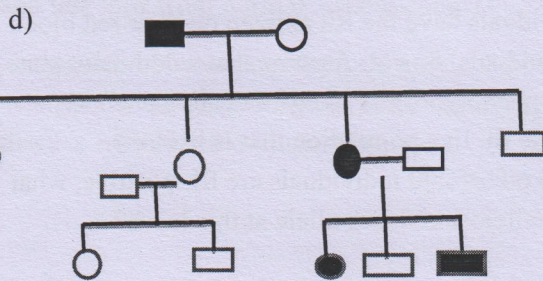
(P.T.O)

(2)



Purple, full – 112  
 Purple, shrunken – 103  
 Yellow, full – 91  
 Yellow, shrunken – 94

- i) Are the genes that determine colour & shape of the kernel assorting independently?  
 ii) What is the recombination frequency between them? 2.5+1.5



On the basis of pattern of inheritance explain the mode of inheritance for the above pedigree.

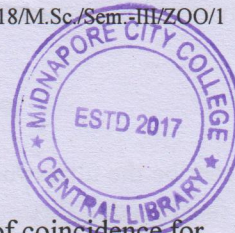
3) Answer any one of the following question:

1×8=8

a) A plant known to be heterozygous at three loci is test crossed. The progeny phenotypes & the numbers are as follows -----

$p^+ r^+ j^+$	- 179
$p r j$	- 173
$p^+ r j$	- 46
$p r^+ j^+$	- 52
$p^+ r j^+$	- 22
$p r^+ j$	- 22
$p^+ r^+ j$	- 4
$p r j^+$	- 2
Total	- 500

(P.T.O)



(3)

Give the gene arrangement, map distances and coefficient of coincidence for three genes. 1+5+2

- b) What is the function of histone protein? How many types of histone proteins are there in chromosome? Why histone protein is positively charged? What is the function of H1 histone? 2+2+2+2

### GROUP-B

#### (Haematology)

4) Answer any two of following:

2×2=4

- a) Name one marker enzyme each of mammalian neutrophil and eosinophil, respectively. Name two physiological important substances released from basophil. (1+1)
- b) Name the erythropoietic organs of teleosts and elasmobranchs, respectively. (1+1)
- c) What is polycythemia? When is it commonly found? (1+1)
- d) Cite one example each of i) anticoagulant of animal origin, ii) anticoagulant of plant origin, iii) synthetic organic anticoagulant and iv) synthetic inorganic anticoagulant.

5) Answer any two of the following question:

4×2=8

- a) Give an illustrated account of encapsulation of metazoan parasites by insect haemocytes.
- b) What is haemophilia? State the basic differences amongst haemophilia A, haemophilia B and haemophilia C. (1+3)
- c) Indicate the cell-lineage found in mammalian erythropoiesis with the help of a flow chart. Mention the name, source, chemical nature and target of the hormone that simulates erythropoiesis. (2+2)

(P.T.O)

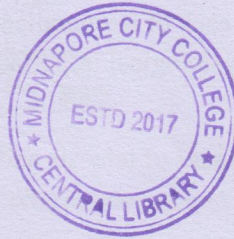
(4)

d) Describe the ultrastructure and functional significance of melanomarcophages of fish blood.

6) Answer any one of the following question:

8×1=8

- a) Why is it desirable to carry out blood cell counts in the morning instead of the afternoon? Explain the principle of Arneth count with illustration. State the normal value of Arneth count. What indications are given by right shift and left shift from normal Arneth count? (1+3+1+3)
- b) Distinguish between leucocytosis and leukemia. Chromosomal translocation activates c-abl protooncogene, resulting in chronic myeloid leukemia – discuss with suitable illustration. (2+6)



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