

PG (CBCS)
M.Sc. Semester- IV Examination, 2023
ZOOLOGY
PAPER: ZOO 403C

(HUMAN DISEASE & MOLECULAR ANALYSIS AND APPLIED GENETICS)

Full Marks: 40

Time: 2 Hours

Write the answer for each unit in separate sheet

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.

ZOO 403C.1

HUMAN DISEASE & MOLECULAR ANALYSIS

F.M. - 20

GROUP-A

1. Answer any **TWO** of the following questions: 2×2=4
- a) What are the regulatory components of a typical expression vector?
 - b) What is linker DNA in rDNA technology?
 - c) Mutation of which human gene causes cystic fibrosis? State the most common signs and symptoms of cystic fibrosis.
 - d) Name one genetic disease caused by inborn errors of amino acid metabolism. Write the causes of the development of Huntington disease.

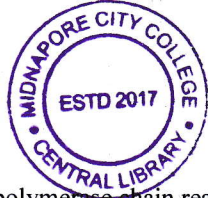
GROUP-B

2. Answer any **TWO** from the following questions: 2×4=8
- a) Briefly explain the universal cloning method by TA strategy?
 - b) Write a short note on pyrosequencing.
 - c) Write down the blue-white screening procedure? What is the difference between screening and selection?
 - d) Why RNA is separated in a denaturing gel by electrophoresis before northern blotting. Name the denaturing agents used in agarose gel. Describe schematically the labelling of DNA by Nick translation.

GROUP-C

3. Answer any **ONE** of the following questions: 1×8=8
- a) Describe : 4+4
 - i. schematically step by step the process for the analysis of gene expression by cDNA microarray, and
 - ii. sequencing of DNA by Sanger dideoxy chain termination method.

(P.T.O)



- b) Briefly explain the Real-time polymerase chain reaction.
What is Taq-Man probe? Why it is used? 5+2+1

ZOO 403C.2
APPLIED GENETICS

F.M. - 20

GROUP-A

4. Answer any **TWO** from the following questions: 2×2=4
- a) Why CpG sequence tend to disappear from human genome?
 - b) What is the differential expression of membrane forms of μ m mRNA?
 - c) Write the significance of HTF island.
 - d) What is an open reading frame (ORF)? Write a DNA sequence containing a short ORF.

GROUP-B

5. Answer any **TWO** from the following questions: 2×4=8
- a) Differentiate between microsatellites and minisatellites. Why are microsatellites better tool for linkage mapping than minisatellites?
 - b) Why BAC vector is more useful than YAC for sequencing human genome?
 - c) What are the mechanisms generating antibody diversity in native B cell?
 - d) What kind of mutation give rise to Huntington disease? What is the evidence that the gene identified as HD is really the gene that cause HD? 2+2=4

GROUP-C

6. Answer any **ONE** from the following questions: 1×8=8
- a) i. What is class switching? How does it involve in the rearrangement of V(H) exon? (1+4)+3=8
 - ii. State the function of VDJ recombinase. 8
 - b) Describe the process of Kappa-light-chain receptor editing. 8
