Parvatibai Chowgule College of Arts and Science
Autonomous

B.Sc. Semester End Examination, January/February 2022 / March 2022

Semester: 5
Subject: Zoology
Paper: Molecular Genetics and Forensic Science (Elective)
Duration: 2 Hours Max. Marks: 45

Instructions: *1. All questions are compulsory*
2. Figures to the right indicate full marks
3. Draw diagrams wherever necessary

Q.1. Answer ANY THREE of the following: (09)

i) Write a brief note on the genetic code.
ii) Comment on the disciplines of forensic science.
iii) Describe the role of enhancers and silencers in the regulation of eukaryotic transcription.
iv) Enlist the various crime scene search methods.

Q.2. Answer ANY TWO of the following: (12)

i) Write a note on initiation of replication in eukaryotes.
ii) Explain the strategies used for recording notes at the crime scene.
iii) Write a note on molecular cytogenetic testing. Add a note on its applications.

Q.3. Answer ANY TWO of the following: (12)

i) Explain the different types of biological evidences found at a crime scene.
ii) Describe the methods of detecting forged documents in forensic science.
iii) Describe in detail the diverse tests categorized as non-invasive prenatal diagnostic tests.

Q.4. Answer ANY ONE of the following: (12)

X) A newborn baby is detected with an autosomal recessive disorder 'A' caused by the accumulation of particular amino acid. In normal individuals, this amino acid is broken down into tyrosine, which is then further converted into neurotransmitters. Identify 'A'. Explain the genetic basis and symptoms of the disorder mentioned above. Discuss the consequences if there is no intervention in treating this disorder. A couple with a child positive for the above disorder plans to go for a second child. What should be the counseling given to the couple for preventing the birth of another child with the same genetic disorder?

OR

Y) In a reaction catalyzed by the enzyme DNA-dependent RNA polymerase, mRNA is being transcribed from DNA in the cytoplasm of a cell. Identify and describe the process mentioned above. How does this process differ in a yeast cell? If due to a mutation, sigma factor becomes non-functional. Explain the effect of this mutation on the above mentioned process.