

2020
ZOOLOGY
[HONOURS]
Paper : X

Full Marks : 50

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **five** questions: 2×5=10
- a) What is the difference between Linkage and Mendelian Inheritance?
 - b) What is the genetic difference between sporadic and hereditary retinoblastoma?
 - c) Show the arrangement of genes in Cis and Trans heterozygotes.
 - d) In a DNA sample 18% of bases are found to be A. What is the % of C?
 - e) What are Introns and Exons?

- f) What do you know by redundancy in genetic code?
- g) What do you mean by silent mutation? What is its significance?
- h) What is the difference between repressor and regulator gene?

2. Answer any **two** questions: 5×2=10
- a) What is hair-pin structure of RNA? What is its function? 3+2=5
 - b) What is cloning? Write the major steps for making a clone. 2+3=5
 - c) Using (+) for productions and (-) for non-production of enzymes in presence and absence of inducer. Compute the following table and give the explanation of these $i^s z^+ a^+ / F' i^+ z^+ a^+$ and $i^+ o^c z^+ a^+$. (z-β galactosidase and a-galactoside transacetylase) 5
 - d) What do you mean by Multiple allele? A man of blood group O marries a women of blood group A. The wife's father is of blood group O. What are the probabilities that their children will belong to blood group 'O'? 2+3=5

3. Answer any **Three** questions: $10 \times 3 = 30$
- a) What do you mean by Proto-oncogene and Oncogene? What is the chief difference between v-onc and c-onc gene? Describe 3 main mechanisms by which protooncogene can be converted to oncogene. $3+1+6=10$
- b) What do you mean by Tautomerism? What is the difference between Transition and Transversion? What is base analogue? Explain the type of mutation by a base analogue. $2+1+2+5=10$
- c) What is taq Polymerase? What is Blotting? What do you mean by gene therapy? What is its utility? Write the differences between *ex vivo* and *in vivo* gene therapy. $2+2+2+2+2=10$
- d) Write the components of replisome and their functions during replication. What roles played by tRNA and mRNA during translation? Write about the formation of 30s initiation complex in prokaryotes. $3+2+5=10$
- e) What is the sex index in Genic balance theory? What are the sex of 3X4A and 3X2A in *Drosophila*? Write the molecular bases of sex determination in *Drosophila* sp. $1+2+7=10$