B.Sc. 5th Semester (Honours) Examination, 2019 (CBCS)

Subject : Zoology

Paper : CC-T-11

(Molecular Biology)

BU

Time : 2 Hours | Full Marks : 40

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

Group-A

1. Answer *any five* questions: 2×5=10

(a) What is Junk DNA? What is its significance?

(b) Whether RNA editing has been observed in all three basic types of RNA? Mention two cell organelle where the said process occurs.

(c) Compare siRNA and miRNA.

(d) Define uniparental disomy. Specify two disorders caused by the same.

(e) Write down the differences between B and Z form of DNA.

(f) Justify the role of IPTG as gratuitous inducer.

(g) What do you mean by abortive initiation?

(h) What is Klenow fragment? How is it utilized in Recombinant DNA technology?

Group-B

2. Answer *any two* questions: 5×2=10

(a) In human, the genome consists of about 25,000 genes while the transcriptome well exceeds the gene numbers. How can it be possible? Diagrammatically represent two transesterification reactions during self splicing. 2+3=5

(b) Write the detailed mechanism of Poly-A tailing during post-transcriptional modification in eukaryotes. 5

(c) Discuss in brief the steps of nucleotide excision repair in human cell. Name one hereditary disorder associated with the same. 4+1=5

(d) Illustrate the event of association of basal transcription factors with their specific role during initiation of eukaryotic m-RNA formation. 5

Group-C

3. Answer *any two* questions: 10×2=20

(a) Elaborate the removal of RNA primer during maturation phase of prokaryotic DNA replication. How does telomerase provide the solution to the end replication problem in eukaryotic DNA? 5+5=10

(b) Describe the event of t-RNA charging in detail. Comment on T_s-T_u cycle. During bacterial translation where the following events take place?

(i) mRNA-tRNA recognition

(ii) Peptidyl transfer reaction

(iii) Exit of polypeptide chain

(iv) Binding of IF1 4+4+2=10

(c) With a flow diagram, present the process of PCR. Why is *Pfu* advantageous over *Taq* polymerase? State what will you use-*ss* or *ds* DNA in DNA sequencing following Sanger's technique. Will you use DNA or RNA probe? Explain. 5+1+2+2=10

(d) Write short notes on: 2½×4=10

(i) Significance of Wobble Hypothesis

(ii) Genetic imprinting as gene regulator

(iii) Northern Blot and its importance

(iv) SOS repair as DNA repair mechanism