

U.G. 5th Semester Examination - 2024**ZOOLOGY****[HONOURS]****Course Code : ZOOL-H-CC-T-11****(Molecular Biology)****Full Marks : 40****Time : 2½ 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 meant by polycistronic DNA?
 - b) What is hnRNA? Why it is so named?
 - c) What is C value paradox?
 - d) Difference between Rho dependent and Rho independent transcription termination.
 - e) How CAP-cAMP operates in lac operon?
 - f) What is the function of aminoacyl t-RNA synthetase?
 - g) Why thermocycler is required in PCR?
 - h) How DNA methylation helps in gene silencing?

[Turn Over]

2. Answer any two questions: $5 \times 2 = 10$

- a) Enumerate the role of proteins involved in elongation and termination of polypeptide chain in eukaryotes.
- b) Why DNA replication is semi-discontinuous? Mention the role of beta clamp. Mention the function of RNase H. $2+2+1$
- c) Describe the process of mRNA 3' polyadenylation. Mention the significance of mRNA 5' capping. $4+1$
- d) Mention the types of DNA repair mechanisms. Discuss about SOS repair.

3. Answer any two questions: $10 \times 2 = 20$

- a) Describe the Watson-Crick model of DNA structure with suitable diagram. Write briefly about carbon skeletons of purine and pyrimidine. $5+2+3$
- b) How a single DNA pol III molecule can operate both in the leading and lagging strands during replication? Explain with suitable diagram. What is the role of helicase enzyme?

$5+3+2$

c) What is Kornberg enzyme? Mention its two role. Describe the process of alternative splicing. Elaborate the process of prokaryotic DNA replication initiation. $2+2+3+3$

d) Write briefly about any two: $5+5=10$

- i) Wobble hypothesis
- ii) Sanger DNA sequencing
- iii) Shine Dalgarno sequence