This question paper contains 3 printed pages. *Your Roll No. .....*

Sl. No. of Ques. Paper : 1428 **F-7**
Unique Paper Code : 2581301
Name of Paper : **Genome Organisation and Function – I**
Name of Course : **B.Sc. (Hons.) Biomedical Sciences**
Semester : **III**
Duration : **3 hours**
Maximum Marks : **75**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all. Question No. 1 is compulsory.
Sub parts of questions should be attempted together.
Draw illustrations or diagrams wherever necessary.

1. (a) Define the following terms (any *five*):
   (i) Codon
   (ii) Polycistronic *m*RNA
   (iii) Translocation
   (iv) Homeodomain
   (v) Promoter
   (vi) Nucleosome. 5×1=5

   (b) Expand (any *five*):
   (i) MAPK
   (ii) RdRp
   (iii) EGF
   (iv) RBS
   (v) SiRNA
   (vi) SINE. 5×1=5

   (c) Differentiate between:
   (i) Minisatellite and Microsatellite
   (ii) DNA polymerase I and DNA polymerase III
   (iii) Twist and Writhe. 3×3=9

2. (a) Give role/significance of the following:

P. T. O.

(i) SMC proteins

(ii) Cohesin

(iii) 7-methyl guanosine cap

(iv) Amino-acyl *t*RNA Asynthetase

(v) DNA gyrase

(vi) DNA ligase

(vii) Helicase

(viii) Cytidine deaminase

(ix) IF-1

(x) HATs. $10\times1=10$

(b) Briefly describe the clover leaf structure of *t*RNA. Name the modified bases present in *t*RNA. 4

3. (a) Ribosome is a ribozyme. Comment. 4

(b) Diagrammatically depict the process of prokaryotic transcription. Write the role of various factors involved. 10

4. Write short notes on following:

(i) Deamination

(ii) Theta replication

(iii) Sanger's sequencing method

(iv) Cot curve. $4\times3\cdot5=14$

5. (a) Give the molecular target and mechanism of action of following:

(i) α-amanitin

(ii) Aminoglycosides

(iii) Puromycin. $3\times3=9$

(b) Some bacteria maintain their genome positively supercoiled. Comment. 2

(c) Hydrolysis of pyrophosphate is the driving force for DNA synthesis. Justify. 3

6. (a) How does ethidium bromide produce DNA mutations? 3

(b) What are various enzymatic activities of DNA polymerase I? 3

(c) Compare genome organization in eukaryotes and prokaryotes. 5

(d) Explain how replication is restricted to only once per cell cycle. 3