Chapter- 06

MOLECULAR BASIS OF INHERITANCE

VERY SHORT ANSWER QUESTIONS (1 mark)

01. Write down the genomic content of *E. coli* and human beings.
02. Why DNA is more stable than RNA?
03. Mention Chargaff's rule.
04. Write a note upon central dogma.
05. How many base pairs are roughly present in one turn of DNA helix and what is the distance between consecutive base pairs in a helix?
06. Mention dual role of dNTPs.
07. Mention dual role of AUG.
08. What are UTRs? Give the significance of it.
09. Define replication fork.
10. Name the largest gene present in human.
11. What are exons and introns?
12. Distinguish between monocistronic and polycistronic DNA.

SHORT ANSWER TYPE QUESTIONS (2 marks)

13. Enlist the components of nucleotides and mention the bonds present in nucleotides.
14. List the criteria associated with genetic material.
15. Write a note upon RNA-world.
16. Diagrammatically represent transcription unit.
17. List any 4 salient features of genetic code.
18. How charging of t-RNA takes place during translation?
19. Write down any 4 goals of HGP
20. Who coined the term "Genetic Codon"? What does it mean?
21. Briefly write Taylor's contribution in proving the semi conservative replication of DNA.
22. How semi-conservative nature of DNA was proved?
23. Enlist any two post transcriptional changes in case of eukaryotes

SHORT ANSWER TYPE QUESTIONS (3 marks)

24. How dinucleotide is formed? Who named nuclein? Write any two salient features of DNA.
25. Define nucleosome. Name the amino acids associated with nucleosome. Give the length of DNA present in nucleosome.
26. Write notes upon: (a) Euchromatin (b) Heterochromatin (c) NHC proteins.
27. Explain Griffith's experiment and Avery's experiment.
28. How "Hershey-Chase" concluded DNA as a genetic material?

29. Write notes upon: (a) Leading strand (b) Okazaki fragments (c) DNA ligase.
30. Write the functions of promoter,terminator,DNA dependent RNA polymerase.
31. Explain the methodologies associated with HGP. Expand BAC and YAC.

LONG ANSWER TYPE QUESTIONS (5 marks)

32. Elaborate the process of transcription in prokaryotes. Expand BAC and YAC.
33. Discuss lac-operon in detail.
34. Give reasons for: (i) Both strands of DNA are not copied during transcription.
(ii) Transcription and translation in bacteria can be coupled.
(iii) Differentiate between prokaryotic and eukaryotic transcription process.
35. (a) What is VNTR? What is the use of it in DNA-fingerprinting?
(b) List the techniques used in DNA-finger printing.
(c) Mention two applications of DNA-finger printing.
(d) Differenciate between bulk and satelite DNA.

HOTS/MODEL QUESTIONS:

01. What is point mutation? Site an example.
02. Who developed automated DNA sequencers?
03. Define bio-informatics.
04. Expand SNPs.
05. List the number of genes present in chromosome-1 and chromosome –y.
06. What do you mean by DNA polymorphism?
07. Expand VNTR and write its size.
08. Write the role of "Har Govind Khorana" in explaining genetic code.
09. Differentiate between VNTR and Probe.
10. What are the functions of "methylated guanine cap" and "poly-A tail" in a mature m-RNA?
11. Define transcription. Which strand acts as template strand and write the regions associated with transcription unit?
12. Calculate the length of DNA of bacteriophage lambda that has 48502 base pairs.
13. Given below is a single stranded DNA molecule. Frame and label its sense and antisense strand and mention the sequence of RNA. SEQUENCE : 5' ATGGGGCTC 3'
14. (a) Name the molecule 'X' synthesized by 'i' gene and how does this molecule gets inactivated?

(b) Which one of the structural genes code for beta- galactosidase?

15. Justify genetic codon in relation with: (a) Unambiguous (b) Degenerate (c) Universal.

16. Draw the figure tRNA and show the following labelings.

(a) Anticodon loop (b) Amino acid acceptor site (c) 5' and 3' end.

17. Why HGP is known as a mega project?

18. Describe the packaging of DNA helix in a prokaryotic and eukaryotic cell. ***(CBSE - 2016)***

19. State the role of Sigma factor and Rho factor in transcription. ***(CBSE - 2016)***

20. How EST and SA is carried out in HGP? ***(CBSE – 2017)***

21. Draw a labeled schematic diagram of replication fork showing leading and lagging strands and write why they run in opposite directions? ***(CBSE - 2017)***

22. Describe the interaction of t-RNA, m-RNA and ribosomes during the events of translation.

(CBSE - 2017)