

M.TECH. DEGREE EXAMINATIONS: DECEMBER 2008

First Semester

BIOTECHNOLOGY

P07BTB31 Molecular Biology

Time: Three Hours

Maximum Marks: 100

Answer ALL the Questions

PART A (20 x 1 = 20 Marks)

1. DNA is..... in nature.
(a). Acidic (b). basic (c). neutral (d). hydrophobic
2. E.coli DNA consists of domains or loops.
(a). 10-50 (b). 50-100 (c). 100-200 (d). 100-500
3. The highly condensed chromosome is seen at
(a). prophase (b). metaphase (c). interphase (d). anaphase
4. The histone which stabilize the nucleosome core is
(a). H₂A (b). H₃ (c). H₄ (d). H₁
5. Origin of replication is rich in
(a). GC (b). AT (c). UT (d). methylated nucleotides
6. Type II topoisomerase is also called as
(a). primeosome (b). DNA gyrase (c). holoenzyme (d). DNA ligase
7. A potent antibiotic which inhibit prokaryotic RNA polymerase initiation is
(a). streptolydigin (b). rifampicin (c). erythromycin (d). penicillin
8. The promoter consists of a sequence between..... base pair in prokaryotes.
(a). 20&30bp (b). 40&50bp (c). 40&60bp (d). 60&80bp
9. The pribnow box has sequence.
(a). TATATA (b). TATAAT (c). TTAATT (d). TATTAT
10. The transcription stop signal RNA hairpin stem structure is rich in
(a). AT (b). AU (c). GC (d). A
11. lac promoter requires an accessory activating factor called
(a). cAMP (b). CRP (c). NADPH (d). ATP
12. is more common at transcription start site than A
(a). G (b). C (c). T (d). U

13. The ribosome binding site in prokaryotic mRNA near initiation codon in protein synthesis is
 (a). TATA box (b). Pribnow box (c). Promoter (d). Shine-Dalgarno sequence
14. IF₁ and IF₃ bind to sub unit of prokaryotic ribosome.
 (a). 30s (b). 50s (c). 60s (d). 40s
15. is the process in which repeated cycles of amino acid is added.
 (a). initiation (b). elongation (c). termination (d). traslocation
16. In eukaryotes, all three stop codons are recognized by
 (a). RF₁ (b).RF₂ (c).eRF (d). EF-T_U
17. The concept of operon was proposed by Jacob & Monod in the Year _____
 (a). 1960 (b).1962 (c).1964 (d). 1961
18. Lac Z, Lac Y and Lac A genes are transcribed from ----- transcription unit.
 (a). Lac ZYA (b). Lac AZX (c).Lac YZX (d).Lac AYX
19. The leader sequence in trp operon is ----- amino acids.
 (a). 15 (b). 12 (c). 14 (d). 16
20. _____ is a Synthetic inducer of lac genes
 (a).IPTG (b).CRP (c).CAMP (d).rpoc gene

PART B (5 X 16 = 80 Marks)

21a. Explain the Griffith experiment and Hershey-Chase experiment to prove that the DNA is genetic materials

(OR)

b. Describe the complex organization of eukaryotic genome and its interaction with histones.

22a.Explain the process of bi-directional replication in E.coli and comment on the role of DNA binding proteins involved in it.

(OR)

b. Write the properties of enkayotic DNA polymerase enzyme and elaborate the events in enkayotic replication.

23a. Describe the structure of RNA polymerase of E.coli. Explain the steps involved in enkayotic transcription by RNA polymerase I.

(OR)

b. Briefly discuss on the splicing mechanism and other post transcriptional modifications occur in eukaryotic nuclear RNAs

24a. Write the mechanism of protein synthesis in E.coli and its post translational modifications.

(OR)

b. Detail the translation initiation step of eukaryotic regulation. Discuss the co-translational modifications with its significance.

25a. Outline the lysogenic life cycle of phage and give the general properties of lysogens.

(OR)

b. Define operon concept. Describe various mechanism of gene regulation at transcription level and detail the tryptophan operon.
