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BRAINWARE UNIVERSITY

Term End Examination 2024-2025

Programme – B.Sc.(MLT)-2022

Course Name – Medical Molecular Biology & Biotechnology

Course Code - BMLTC603

(Semester VI)

Full Marks : 60

Time : 2:30 Hours

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 15=15

1. Choose the correct alternative from the following :

- (i) Which enzyme relieves supercoiling during DNA replication?
 - a) Ligase
 - b) Topoisomerase
 - c) Helicase
 - d) Primase
- (ii) Which DNA repair mechanism fixes UV-induced thymine dimers?
 - a) Base excision repair
 - b) Nucleotide excision repair
 - c) Mismatch repair
 - d) Homologous recombination
- (iii) Which DNA repair mechanism corrects replication errors?
 - a) Nucleotide excision repair
 - b) Base excision repair
 - c) Mismatch repair
 - d) Homologous recombination
- (iv) Which process ensures genetic stability after DNA damage?
 - a) Mutation accumulation
 - b) DNA repair
 - c) RNA interference
 - d) Alternative splicing
- (v) What is the function of exonuclease activity in DNA polymerase?
 - a) Removes incorrectly paired bases
 - b) Synthesizes new DNA
 - c) Seals gaps
 - d) Binds to promoters
- (vi) Identify the primary protein component of the nucleosome?
 - a) RNA polymerase
 - b) Histone proteins
 - c) DNA polymerase
 - d) Ligase
- (vii) Compare heterochromatin and euchromatin?
 - a) Heterochromatin is transcriptionally active
 - b) Euchromatin is highly compacted
 - c) Euchromatin is more transcriptionally active
 - d) Heterochromatin does not contain histones
- (viii) RNA polymerase III transcribes which type of RNA?
 - a) mRNA
 - b) tRNA
 - c) rRNA
 - d) miRNA

- (ix) Which of the following antibiotics inhibits protein synthesis by binding to the 30S ribosomal subunit?
 - a) Chloramphenicol
 - b) Tetracycline
 - c) Rifampicin
 - d) Puromycin
- (x) Which structure is responsible for transferring the correct amino acid to the ribosome during translation?
 - a) tRNA
 - b) rRNA
 - c) mRNA
 - d) DNA
- (xi) What is the key property of malignant tumors?
 - a) Limited growth
 - b) Inability to invade tissues
 - c) Ability to metastasize
 - d) Benign nature
- (xii) What is the significance of p53 in cancer biology?
 - a) It acts as an oncogene
 - b) It inhibits apoptosis
 - c) It regulates cell cycle checkpoints
 - d) It promotes metastasis
- (xiii) What is the main cause of genetic instability in cancer cells?
 - a) Loss of cell cycle control
 - b) Increased DNA repair
 - c) Decreased mutations
 - d) Low proliferation rate
- (xiv) A clinical lab receives a biopsy sample from a patient suspected of having colorectal cancer. Which molecular tool would be most suitable for detecting specific oncogene mutations?
 - a) Western Blot
 - b) PCR-based sequencing
 - c) Chromosome staining
 - d) SDS-PAGE
- (xv) What is the purpose of RT-PCR in molecular biology?
 - a) Detects protein expression
 - b) Measures mRNA levels
 - c) Cuts DNA at specific sites
 - d) Separates DNA fragments

Group-B

 $3 \times 5 = 15$

OR

Group-C

 $5 \times 6 = 30$

OR
