BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Microbiology

Course Name – Molecular Biology

Course Code - BMBC303

Semester / Year - Semester III

Time allotted : 75 Minutes Full Marks : 60

[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 60=60

1. *(Answer any Sixty)*

(i) Which of the following bonds are broken during DNA replication?

a) hydrogen bonds between bases
b) phosphodiester bonds
c) covalent bonds between bases
d) ionic bonds between bases and phosphate groups

(ii) Which base is not found in RNA?

a) adenine
b) cytosine
c) thymine
d) uracil

(iii) To prevent premature termination of replication DNA Polymerase ? and DNA Polymerase ? hold by

a) PDNA ring
b) SSB
c) PCNA ring
d) PRNA ring

(iv) Tetracycline blocks protein synthesis by

a) inhibiting binding of aminoacyl tRNA to ribosome
b) inhibiting initiation of translation
c) inhibiting peptidyl transferase
d) inhibiting translocase enzyme

(v) Which technique was used to determine the double-helical structure of DNA?

a) Electrophoresis
b) Chromatography
c) Centrifugation
d) X-ray crystallography

(vi) Which of the following options, A – D, are the pyrimidine bases found in DNA?

a) uracil and thymine
b) thymine and cytosine
c) adenine and thymine
d) cytosine and uracil

(vii) Who is credited with discovering the structure of DNA?

a) Crick and Neck
b) Watson and Crick
c) Watson and Franklin
d) Holmes and Watson

(viii) In Prokaryotes, the ribosomal binding site on mRNA is called

a) Hogness sequence
b) Shine-Dalgarno sequence
c) Pribnow sequence
d) TATA box

(ix) Name the protein, which is used to keep separate by holding them in place so that each strand can serve as a template for new DNA synthesis.

a) SSB
b) DNA C
c) DNA B
d) RNA H

(x) The RNA primer from daughter strand of eukaryots is cleaved by

a) Helicase
b) FEN1
c) Telomerase
d) RNA H

(xi) Which of the following statement is false about DNA?

a) Located in chromosome
b) Carries genetic information from parent to offspring
c) Abundantly found in the cytoplasm
d) There is a precise correlation between amount of DNA and number

(xii) Replication in Leading strand of Eukaryotic catalyzed by

a) DNA Polymerase ?
b) DNA Polymerase ?
c) RNA Polymeras ?
d) RNA Polymerase ?

(xiii) Process in which ribosome reads sequence carried by mRNA and joins amino acids to form protein is called

a) Denomination
b) Translation
c) Segregation
d) Transcription

(xiv) Synthesis of RNA from DNA is

a) Transcription
b) Translation
c) Metabolism
d) Reduction

(xv) DNA present on chromosome is responsible for

a) Mitosis of cells
b) Characteristics of cells
c) Location of cells
d) Life of cells

(xvi) Telomere length is maintain by

a) Isomerase
b) Telomerase
c) Polymerase
d) Helicase

(xvii) In a nucleotide, the nitrogen base is joined to the sugar molecule by

a) Phosphodiester bond
b) Glycosidic bond
c) Hydrogen bond
d) Phosphodiester bond &Glycosidic bond

(xviii) What is not True for DNA in prokaryotes?

a) Present in the form of a compact structure called nucleoid
b) The coils are maintained by non-histone basic proteins
c) Found in cytoplasm in a supercoiled condition
d) Packaged as nucleosomes along with histones

(xix) Pick the right difference between a DNA and RNA

a) Sugar and phosphate
b) Sugar and purines
c) Purines and phosphate
d) Sugar and pyrimidines

(xx) When DNA replication starts

a) The phosphodiester bonds between the adjacent nucleotides break
b) The bonds between the nitrogen base and deoxyribose sugar break
c) The leading strand produces Okazaki fragments
d) The hydrogen bonds between the nucleotides of two strand break

(xxi) Cistron is

a) The coding sequence of DNA
b) The functional unit of DNA molecule that codes for a particular gene product
c) Intervening non coding sequence of DNA
d) The sequences which are removed during RNA splicing.

(xxii) Which of the following enzymes is the principal replication enzyme in E. coli?

a) DNA polymerase I
b) DNA polymerase II
c) DNA polymerase III
d) None of these

(xxiii) The coding sequences found in split genes are called

a) Operons
b) Introns
c) Exons
d) Cistrons

(xxiv) For termination of replication in prokaryotic system?

a) Dna C
b) SSB
c) Tus protein
d) DNA polymerase

(xxv) Sickle cell anemia is caused

a) When valine is replaced by glutamic acid in beta polypeptide chain
b) When glutamic acid is replaced by valine in beta polypeptide chain

c) When glutamic acid is replaced by valine in alpha polypeptide chain

d) When valine is replaced by glutamic acid in alpha polypeptide chain

(xxvi) Wobble position means

a) Base paring

b) Altered base on code

c) Third altered base on codon

d) None of these

(xxvii) Peptidyl transferase

a) Is a 23s rRNA

b) Forms peptide bonds

c) Component of ribosome

d) All the three

(xxviii) Select the incorrect statement out of the four given below about lac operon when Lactose is present in the medium.

a) Gene – A gets transcribed into mRNA which produces ?-galactoside permease

b) Inducer-Repressor complex is formed

c) Lactose inactivates repressor protein

d) RNA polymerase transcribe Z-gene, Y-gene and A-gene

(xxix) Enzyme which can break the DNA strand

a) Topoisomease II

b) Helicase

c) Primase

d) Restriction endonuclease

(xxx) Which of the statements give below is correct with respect to frame shift mutation

a) Single nucleotide base change, insertion, or deletion of the genetic material

b) Glutamine is replaced by valine

c) Sickle cell anemia is an example

d) Insertions or deletions of a number of nucleotides in a DNA sequence that is not divisible by three.

(xxxi) The structural genes of lac operon transcribe mRNA which is

a) Polycistronic

b) Replicative

c) Monokaryotic
d) Monocistronic

(xxxii) If the sequence of bases in DNA is TACCGACCA, then the sequence of codons on the transcript will be

a) ATGGCTGGT
b) ATCCGAACU
c) AUGGCUGGU
d) AUGGACUAA

(xxxiii) Genes which are active all the time synthesizing substances needed by the cell are called

a) Cellular luxury genes
b) Metabolic genes
c) House keeping genes
d) Control genes

(xxxiv) ISSR is a

a) DNA marker
b) Protein marker
c) Both DNA marker & Protein marker
d) None of these

(xxxv) At the physiological pH, the DNA molecules are;

a) Positively charged
b) Negatively charged
c) Amphipathic
d) Neutral

(xxxvi) Eukaryotes differ from prokaryote in mechanism of DNA replication due to

a) Use of DNA primer rather than RNA primer
b) Different enzyme for synthesis of lagging and leading strand
c) Discontinuous rather than semi-discontinuous replication
d) Unidirectional rather than semi-discontinuous replication

(xxxvii) Which of the following reactions is required for proofreading during DNA replication by DNA polymerase III?

a) 5’ to 3’ exonuclease activity
b) 3’ to 5’ exonuclease activity
c) 3’ to 5’ endonuclease activity
d) 5’ to 3’ endonuclease activity

(xxxviii) Which of the following enzymes remove supercoiling in replicating DNA ahead of the replication fork?

a) DNA polymerases
b) Helicases
c) Primases
d) Topoisomerases

(xxxix) DNA unwinding is done by

a) Ligase
b) Helicase
c) Topoisomerase
d) Hexonuclease

(xl) The enzyme used to join bits of DNA is

a) DNA polymerase
b) DNA ligase
c) Endonuclease
d) Primase

(xli) Which of the following protein is required for connecting Okazaki fragments?

a) Scaffold protein
b) Helicase
c) Primase
d) DNA gyrase

(xlii) Name the protein, which is used for termination of replication?

a) DnaC
b) SSB
c) Tus protein
d) DNA polymerase

(xliii) The role of primase is to

a) dismantle RNA primer
b) cleave and unwinds short sections of DNA ahead of the replication fork
c) proofread base pairing
d) synthesize an RNA primer to begin the elongation process

(xliv) If the mutation has a negligible effect on the function of a gene, it is known as a

a) Silent mutation
b) Frame shift mutation

c) Substitution mutation
d) Insertion mutation

(xlv) Which of the following mechanisms will remove uracil and incorporate the correct base?

a) Direct repair
b) Base excision repair
c) Mismatch repair
d) Nucleotide excision repair

(xlvi) Which of the following has the self-repairing mechanisms?

a) DNA and RNA
b) DNA, RNA and protein
c) Only DNA
d) DNA and proteins

(xlvii) The function of enzyme involved in base excision repair is

a) Addition of correct base
b) Addition of correct nucleotide
c) Removal of incorrect base
d) Removal of phosphodiester bond

(xlviii) The DNA polymerase involved in base excision repair is

a) DNA polymerase ?
b) DNA polymerase ?
c) DNA polymerase ?
d) DNA polymerase ?

(xlix) A point mutation that replaces a purine with another purine, or a pyrimidine with another pyramidine

a) Nonsense mutation
b) Silent mutation
c) Transition mutation
d) Transversion

(l) The enzyme of E.coli is a nuclease that initiates the repair of double stranded DNA breaks by homologous recombination

a) DNA glycosylase
b) DNA ligase
c) DNA polymerase
d) RNA polymerase

(li) The enzyme photolyase is used in what method of repair?

a) Base excision
b) Photo reactivation

c) Nucleotide excision
d) None of these

(lii) The process of formation of RNA is known as_____

a) Replication
b) DNA repair
c) Translation
d) Transcription

(liii) Name the site where upstream sequences located?

a) Prior to start point
b) After the start point
c) Right border of DNA
d) In the middle of DNA

(liv) Which of the following is TRUE for the RNA polymerase activity?

a) DNA dependent DNA synthesis
b) Direct repair
c) DNA dependent RNA synthesis
d) RNA dependent RNA synthesis

(lv) Who discovered RNA polymerase?

a) Samuel B. Weiss
b) Nirenberg
c) Watson and Crick
d) Darwin

(lvi) What is the work of the sigma factor in transcription?

a) Helicase action
b) Transcription initiation
c) Transcription elongation
d) Transcription termination

(lvii) Which of the following RNA constitutes 90 percent of the total cellular RNA?

a) rRNA
b) tRNA
c) mRNA
d) hnRNA

(lviii) The synthesis of polynucleotide chain of mRNA is catalyzed by the enzyme _____

a) RNA helicase
b) RNA polymerase
c) DNA polymerase
d) DNA helicase

(lix) Which of the following are non-sense codons?

a) AUG
b) GUG
c) UAA
d) UCU

(lx) Which protein mentioned below can reverse central dogma?

a) Ribosome
b) Restriction Endonuclease
c) Reverse Transcriptase
d) RNA Polymerase