



BRAINWARE UNIVERSITY

Term End Examination 2019 – 20

Programme – Master of Science in Biotechnology

Course Name – Molecular Biology

Course Code – MBT103

(Semester – 1)

Time allotted: 2 Hours 30 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)

20 x 1 = 20

1. Answer any *twenty* from the following
 - (i) Which base is not found in RNA?

a. adenine	b. cytosine
c. thymine	d. uracil
 - (ii) Which technique was used to determine the double-helical structure of DNA?

a. Electrophoresis	b. Chromatography
c. Centrifugation	d. X-ray crystallography
 - (iii) If 30% of the bases in a DNA molecule are adenine, what percentage of the bases are guanine?

a. 20%	b. 30%
c. 35%	d. 70%
 - (iv) Replication occurs once every cell generation during

a. S phase	b. T phase
c. C phase	d. A phase
 - (v) Round structures of Deoxyribonucleic Acid (DNA) around histone proteins are called

a. Mono hybrid genes	b. Hybrid genes
c. Chromosomes	d. Nucleosomes
 - (vi) Process of condensing many small molecules to form one large molecule is called

a. Polymerization	b. Condensation
c. Hydrolysis	d. Oxidation

- (xv) Which one of the following enzymes is not a protein;
- | | |
|----------|-------------|
| a. DNase | b. Abzyme |
| c. EcoRI | d. Ribozyme |
- (xvi) Distance between two base pairs of DNA is;
- | | |
|------------|------------|
| a. 34 nm | b. 3.4 nm |
| c. 0.68 nm | d. 0.34 nm |
- (xvii) RNA responsible for directing proper sequence of amino acids in protein synthesis is;
- | | |
|--------------------|------------------|
| a. Chromosomal RNA | b. Ribosomal RNA |
| c. Messenger RNA | d. Transfer RNA |
- (xviii) The smallest RNA is
- | | |
|---------|--------------------|
| a. tRNA | b. mRNA |
| c. rRNA | d. Chromosomal RNA |
- (xix) Cytoplasmic DNA constitutes a total of
- | | |
|-----------|-----------|
| a. 95-99% | b. 45-50% |
| c. 65-70% | d. 1-5% |
- (xx) Operon model for gene regulation was proposed by
- | | |
|------------|-------------------|
| a. Benzer | b. Jacob & Monod |
| c. Khorana | d. Beadle & Tatum |
- (xxi) The chemical name of thymine is
- | | |
|----------------------------|---------------------------------|
| a. 2-oxy-4-aminopyrimidine | b. 2,4-dioxy-5-methylpyrimidine |
| c. 2,4-dioxypyrimidine | d. None of these |
- (xxii) mRNA has a molecular weight of
- | | |
|----------------|----------------|
| a. 15000-30000 | b. 20000-35000 |
| c. 25000-40000 | d. 30000-50000 |
- (xxiii) More than _____ specific mRNA are effected by insulin
- | | |
|--------|-------|
| a. 100 | b. 80 |
| c. 50 | d. 20 |
- (xxiv) Lac operon is nothing but
- | | |
|---------------------|-------------------|
| a. Structural genes | b. Operator genes |
| c. Both a & b | d. None of these |
- (xxv) SSR marker are
- | | |
|--------------------|--------------------|
| a. Micro satellite | b. Macro satellite |
| c. Both a & b | d. None of these |

Group – B

(Short Answer Type Questions)

4 x 5 = 20

Answer any *four* from the following

- | | | | |
|----|-----|--|---|
| 2. | (a) | What are overlapping genes? | 4 |
| | (b) | Give example. | 1 |
| 3. | (a) | Describe split genes? | 4 |
| | (b) | Give example. | 1 |
| 4. | (a) | Explain palindromic sequence of DNA? | 4 |
| | (b) | Highlight its role. | 1 |
| 5. | (a) | What is the lac operon? | 2 |
| | (b) | Briefly explain it. | 3 |
| 6. | | Justify the reason for arrangement of many prokaryotic genes in operons. | 5 |
| 7. | (a) | What is DNA Polymerase I? | 2 |
| | (b) | Explain its enzymatic activities. | 3 |

Group – C

(Long Answer Type Questions)

2 x 10 = 20

Answer any *two* from the following

- | | | | |
|-----|-----|---|-----|
| 8. | (a) | Explain Reverse transcription with diagram | 3+2 |
| | (b) | What are the different activities shown by Reverse Transcriptase enzyme | 5 |
| 9. | (a) | What is genetic code? | 2 |
| | (b) | Elucidate different Post transcriptional modifications | 8 |
| 10. | (a) | What are introns? | 3 |
| | (b) | Write short notes on 'exon' & 'satellite DNA' | 6 |
| | (c) | What is housekeeping gene? | 1 |
| 11. | (a) | What is the full form of PCR? | 1 |
| | (b) | Write its types with specifications. | 3+2 |
| | (c) | Write in detail the protocol of 25µl PCR with 30 cycles. | 4 |
