

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

 $20 \times 1 = 20$

[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)

Answer any twenty from the following 1. (i) Which base is not found in RNA? a. adenine b. cytosine d. uracil c. thymine (ii) Which technique was used to determine the double-helical structure of DNA? a. Electrophoresis b. Chromatography c. Centrifugation d. X-ray crystallography If 30% of the bases in a DNA molecule are adenine, what percentage of the bases are (iii) guanine? a. 20% 30% h. c. 35% 70%

(v) Round structures of Deoxyribonucleic Acid (DNA) around histone proteins are called

Replication occurs once every cell generation during

a. Mono hybrid genes

b. Hybrid genes

b. T phase

d. A phase

c. Chromosomes

a. S phase

c. C phase

(iv)

- d. Nucleosomes
- (vi) Process of condensing many small molecules to form one large molecule is called
 - a. Polymerization

b. Condensation

c. Hydrolysis

d. Oxidation

(V11)	If a DNA contains 1000 base pairs, w	hat would be	e its length?			
	a. 3400 Å	b.	34000 Å			
	c. 6800 Å	d.	1000 Å			
(viii)	Teminism is					
	a. Central dogma reverse	b.	Central dogma of molecular biology			
	 c. Circular flow of hereditary material 	d.	An effect of cytoplasm on functioning of DNA			
(ix)	Read the statements given below and	identify the i	incorrect statement			
	 a. The human genome contains 3164.7 million nucleotide base 		The average gene consists of 30,000 bp			
	c. The total number of genes is estimated at 30,000.	d.	Chromosome Y has 231 genes			
(x)	Peptidyl transferase					
	a. Is a 23s rRNA	b.	Forms peptide bonds			
	c. Component of ribosome	d.	All the three			
(xi)	Arrange the following events in the order of synthesis of a protein i) A peptide bond forms ii) A tRNA matches its anticodon to the codon in the A- site iii) The movement of second tRNA complex from A-site to P-site iv) The large subunit attaches to the small subunit and the initiator tRNA fits in the P-site v) A small subunit binds to the mRNA vi) The activated amino acid tRNA complex attaches the initiation codon on mRNA					
	a. iv, v, iii, ii, i, vi	b.				
	c. v, iv, iii, ii, vi, I	d.	v, vi, iv, ii, i, iii			
(xii)	Enzyme which can break and seal the DNA strand					
	a. Topoisomease II	b.	Helicase			
	c. Primase	d.	Restriction endonuclease			
(xiii)	The stretch of codons between AUG and a stop codon is called					
	a. Open reading frame	b.	TATA box			
	c. Colinearity	d.	Degenerate			
(xiv)	(B) Peptidyl transferase (C) DNA polymerase (D) DNA ligase (E) Aminoacyl synthetase enzyme (D)	n of amino acid A fragments DNA helix onds between amino acids thesis of RNA primer				
	a. A-O, B-P, C-Q, D-N, E-M, F		A-R, B-M, C-N, D-Q, E-P, F-O			
	c. A-M, B-R, C-P, D-Q, E-N, F	-O d.	A-R, B- Q, C- A, D- M, E-P, F-N			

(xv)	Which one of the following enzymes is not a protein;				
	a.	DNAse	b.	Abzyme	
	c.	EcoRI	d.	Ribozyme	
(xvi)	Distar	ace 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 sequen	ce of	amino acids in protein synthesis is;	
	a.	Chromosomal RNA	b.	Ribosomal RNA	
	c.	Messenger RNA	d.	Transfer RNA	
(xviii)	The sr	mallest RNA is			
	a.	tRNA	b.	mRNA	
	c.	rRNA	d.	Chromosomal RNA	
(xix)	Cytop	lasmic DNA constitutes a total of			
	a.	95-99%	b.	45-50%	
	c.	65-70%	d.	1-5%	
(xx)	Opero	n model for gene regulation was propo	sed b	y	
	a.	Benzer	b.	Jacob & Monod	
	c.	Khorana	d.	Beadle & Tatum	
(xxi)	The cl	nemical 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	A has a molecular weight of			
	a.	15000-30000	b.	20000-35000	
	c.	25000-40000	d.	30000-50000	
(xxiii)	(xxiii) More than specific mRNA are effected by insulin				
	a.	100	b.	80	
	c.	50	d.	20	
(xxiv)	Lac of	peron is nothing but			
	a.	Structural genes	b.	Operator genes	
	c.	Both a & b	d.	None of these	
(xxv)	SSR n	narker are			
	a.	Micro satellite	b.	Macro satellite	
	c.	Both a & b	d.	None of these	

Group-B

Answer any four from the following 2. (a) What are overlapping genes? (b) Give example. 3. (a) Describe split genes? (b) Give example. 4. (a) Explain palindromic sequence of DNA? (b) Highlight its role. 5. (a) What is the lac operon? (b) Briefly explain it. 6. Justify the reason for arrangement of many prokaryotic genes in operons. 7. (a) What is DNA Polymerase I? (b) Explain its enzymatic activities. Group – C (Long Answer Type Questions) Answer any two from the following 8. (a) Explain Reverse transcription with diagram (b) What are the different activities shown by Reverse Transcriptase enzym	2
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8. (a) Explain Reverse transcription with diagram	$2 \times 10 = 20$
(b) What are the different activities shown by Reverse Transcriptase enzym	3+2
9. (a) What is genetic code?	5 2
(b) Elucidate different Post transcriptional modifications	
10. (a) What are introns?	8
(b) Write short notes on 'exon' & 'satellite DNA'	6
(c) What is housekeeping gene?	
11. (a) What is the full form of PCR?	1
(b) Write its types with specifications.	1
(c) Write in detail the protocol of 25µl PCR with 30 cycles.	1
	1 3+2 4

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