

2017**M.Sc. 2nd Semester Examination****MICROBIOLOGY****PAPER—MCB-202***Full Marks : 40**Time : 2 Hours**The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.***Group-A****[20 Marks]****Answer any two questions. 2×10**

1. (a) Explain the logistic growth of population with suitable diagram.
- (b) Describe X-linked dominant inheritance.
- (c) How many genetically different eggs can be produced by a woman of the Aa Bbcc Dd genotype.
- (d) Define epistatic and hypostatic gene. 3+3+2+2

(Turn Over)

2. (a) A sample of one thousand individuals were subjected for testing of MN blood antigen and was found to be distributed as : M = 380, MN = 460, N = 160. Determine the frequency of M and N gene.
- (b) What is Karyotyping ?
- (c) A monogenic multi-allelic trait may display different phenotypes due to interaction in a dominant-recessive and or codominant manner. Justify the statement by using the example of blood group alleles.
- (d) State the salient distinguishing features of B-DNA and Z-DNA. 2+1+4+3
3. Write short notes on (any five) : 5×2
- (a) Kinetochore and its importance ;
- (b) Bass body ;
- (c) Solenoid ;
- (d) Monogenic trait and polygenic trait ;
- (e) C-value paradox ;
- (f) mt-DNA ;
- (g) Linkage group ;
- (h) Selfish DNA.

Group-B

[20 Marks]

Answer any *two* questions.

4. (a) Explain the role of "Topoisomerases" in DNA replication.
- (b) "Gene expression can be measured" — explain with suitable reasons.
- (c) Give the idea of biological mutagen with example.
- (d) Represent diagrammatically a typical eukaryotic mRNA with appropriate labelling of important genetic elements.

3+4+1+2

5. (a) What do you mean by epigenetics ? Give three examples of successful epigenetic regulation.
- (b) Elucidate the role of DNA mismatch repair with example of a human disease that is related to this phenomenon.
- (c) What is the activity of O^6 — alkylguanine alkyl transferase ?

(2+3)+4+1

6. Write short notes on (any *two*):

5×2

- (a) Difference between siRNA and miRNA with respect to dsRNA for RNAi-mediated gene silencing in vivo.
 - (b) Non-homologous End Joining (NHEJ).
 - (c) Xeroderma pigmentosum.
 - (d) Post transcriptional gene silencing (PTGS).
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