

Microbiology (P.G.)

[CBCS]

M.Sc. Third Semester End Examination-2023

(Regular & Supplementary Paper)

PAPER-301

Full Marks: 40

Time: 02 Hrs

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

Group A (MCB 301.1)

Full Marks 20

Cell Biology and Genetic Engineering

1. Answer any two questions of the following: **2x2= 4**
- What is callus culture and how does it differ from suspension culture?
 - What is Gap junction?
 - Differentiate between microtubule and microfilament.
 - What are integrins?

(2)

2. Answer any two questions of the following: **2x4= 8**
- a. What is quorum sensing? What are the advantages of studying quorum sensing mechanism? **2+2**
 - b. Describe the role Cyclins and Kinases in cell cycle regulation.
 - c. Describe the role of p⁵³ in cancer progression.
 - d. Briefly discuss about the intrinsic and extrinsic pathways of apoptosis. **2+2**
3. Answer any one question of the following: **1x8=8**
- a. Define Leukemia. Briefly describe the role of tumor suppressor genes in tumorigenesis. Why is serum used in cell culture media? Briefly state the applications of stem cells. **1+2+2+3**
 - b. What is micro propagation? What are the different steps of micro propagation? Why tissue culture is important? **2+4+2**

Group B (MCB 301.2)

Full Marks 20

1. Answer any two questions of the following: **2x2= 4**
- a) What is the difference between gene expression Analysis by northern analysis and cDNA microarray? **2**
 - b) Write down the difference between (i) T4 DNA ligase and *E. coli* DNA ligase, (ii) type I and type II restriction endonucleases **1+1**

(3)

- c) Distinguish between (i) lambda bacteriophage insertion vector and replacement vector. (ii) cDNA and genomic DNA. **1+1**
 - d) What is chromosomal walking? **2**
2. Answer any two questions of the following: **2x4= 8**
- a) Name the techniques by which plasmid DNA can be introduced in the bacteria? How alpha complementation is used for the selection of nonrecombinant and recombinant bacteria (blue white) after transformation? **1+3**
 - b) Differentiate between RT-PCR and PCR mechanism. Write down general features of primer designing. **2+2**
 - c) Describe the application of DNA fingerprinting in forensic investigation. How recombinant insulin is produced in *E. coli*? **2+2**
 - d) How a cDNA library made in plasmid expression vector is screened immunologically to obtain desired clone using antibody as probe? **4**
3. Answer any one question of the following: **1x8=8**
- a) Write short notes on (i) DNA foot printing (ii) pyrosequencing (iii) Bt cotton (iv) RFLP **4x2**
 - b) Discuss briefly the principle and procedure of (i) automated DNA sequencing and (ii) N-terminal amino acid sequencing by Edman degradation method. **4+4**