

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: M. Pharm
BRANCH: PHARMACY**

**SEMESTER: I
SESSION: MO/2025**

SUBJECT: MPL104T CELLULAR AND MOLECULAR PHARMACOLOGY

TIME: 3.00 Hours

FULL MARK: 75

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
 2. Before attempting the question paper, be sure that you have got the correct question paper.
 3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
 5. Answer any five questions.
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| 1a. | Describe direct and Indirect fluorescence conjugation for microscopy. Describe the mechanism of action of JC-1 in apoptosis detection with excitation and emission spectra. | [7] |
| 1b. | Describe the difference between primary cells and an immortalised cell line. Write down the classification of immunomodulators. | [8] |
| 2a. | Describe various types of antibodies present in the human body and their function. Write down the classification of various types of receptors associated with GPCRs. | [7] |
| 2b. | Describe the basic structure and classification of GPCRs based on Sequence homology and functional similarity. What are the signalling molecules and ligands for GPCR signalling? | [8] |
| 3a. | Write down the basic difference between Complete media and Basal media. | [7] |
| 3b. | What is the subculturing process? Describe the Cryopreservation process. What is the role of DMSO in cryopreservation? | [8] |
| 4a. | Illustrate different steps through which expression of any gene can be modulated in the cell. | [7] |
| 4b. | Define RNA interference. Explain in detail the mechanism and functions of silencing RNA. | [8] |
| 5a. | Define Genome. Explain the organization of Chromatin in nucleus. | [7] |
| 5b. | Differentiate the morphological changes in Apoptosis and Necrosis. Describe the mechanism of apoptosis in detail. | [8] |
| 6a. | Illustrate the role of EGFR/MAPK pathway in inducing the kinase cascade | [7] |
| 6b. | Enlist the proteins involved in JAK-STAT pathway. How this pathway could be shunted or halted? | [8] |
| 7a. | Illustrate the function of an ion channel receptor in the light of any physiological event | [7] |
| 7b. | Write a note function of protein cascades in the background of cAMP pathway | [8] |

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