

Program	Institute
M.Phil Stem Cell Technology & Regenerative Biology	Manipal Institute of Regenerative Medicine (MIRM), Bengaluru

Department Test (DT) 2022 Details

- Test Duration: 100 minutes
- Total Questions: 100 Multiple Choice Questions (MCQs)
- Max Marks: 400
- Marking Scheme: +4 for every correct answer, -1 for every wrong answer, 0 for every unanswered question
- Schedule: mid-June 2022 (tentative), Mode and Exact dates of Department Test (DT) will be updated at www.manipal.edu/dt

LIFE SCIENCES

Cell Structure: Prokaryotic cell and Eukaryotic cell, **Macromolecules in Cells:** DNA, RNA, Proteins, Lipids. Structure and Regulation of Eukaryotic Chromosomes. Replication, Transcription and Translation. **Energy Metabolism:** Glycolysis, Citric Acid Cycle and Oxidation Phosphorylation. **Cell Signaling:** General Principles. **Model Organisms:** *E. coli*, Yeast, Flies, Fish, Worms and Mice. **Membrane Structure:** Lipid Bilayer & Membrane Proteins. **Membrane Enclosed Organelles:** Nucleus, Endoplasmic Reticulum, Golgi Apparatus, Lysosomes, Endosomes, Mitochondria, Peroxisomes. **Cytoskeleton:** Intermediate Filaments, Microtubules, Actin Filaments. **Cell-Division Cycle:** Eukaryotic Cell Cycle, Mitosis, Cytokinesis, Meiosis, Fertilization. **Development of Multicellular Organisms:** Gastrulation, Neurulation, Left–Right Asymmetry of the Vertebrate Body. **Tissue Architecture:** Extracellular Matrix, Epithelial Sheets, Cell Junctions, Cell-Cell Adhesion, Cell-Matrix Adhesion, Architecture of Neural Tissue & Cardiac Tissue & Hepatic Tissue & Skin. **Immunology:** Cells of Immune System, Humoral Immunity, Cell Mediated Immunity, Monoclonal Antibodies. **Tissue Maintenance and Self Renewal:** Renewal of tissues, Resident Stem Cells in Different Tissues, Hematopoietic Stem Cell, Therapeutic cloning, Reproductive Cloning. **Induced Pluripotency. Cell Death:** Necrosis, Apoptosis. **Cancer:** Evolution of Cancer cells, Proliferation, Invasion and Metastasis, Accumulation of Mutations, Oncogenes and Tumor Suppressor Genes. **Modern Recombinant DNA technology:** Genome Sequencing, Microarray, RNA Interference, Gene Knockouts, Reporter Genes.

♣ Best of Luck ♣

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