

ST. XAVIER'S COLLEGE (AUTONOMOUS), KOLKATA

PAPER FORMAT & SYLLABUS FOR PG DIPLOMA IN MOLECULAR MEDICAL MICROBIOLOGY ENTRANCE 2025

Department: PG and Research Department of Microbiology and TATA Medical Center

Time of examination: 2 hours and 30 mins

Total Marks: 100

Format of Question:

50 Multiple Choice questions (2 marks each): 50X2=100

❖ Syllabus

1. Bioinstrumentation: Basic Principles of Spectroscopy, Microscopy, Chromatography, pH meter, Centrifugation, Electrophoresis: Types, Principles and application, FACS

2. Enzymology : General Features of Enzyme Catalysis, Different Theories of Enzyme Catalysis, Catalytic Strategies, Detailed Study of a Model Enzyme to Understand Various Catalytic Strategies. Enzyme Kinetics: Hyperbolic Kinetics, Concept of Enzyme-Substrate Complex, Equilibrium Assumption and Michaelis-Menten Equation, Concept of K_s , Steady State

3. Recombinant DNA technology: Principles and methods of recombinant DNA technology- hybridization, cloning, DNA Sequencing techniques, Polymerase chain reaction, Real Time PCR

4. Immunological techniques: Immunological techniques: Antibody generation, Antibody isolation and purification, Hybridoma technique, ELISA, ELISPOT, surface plasmon resonance, radioimmunoassay, Immunoblotting, Fluorescent Immunoassay (FIA) and Chemiluminescence Immunoassay (CLIA), Immunohistochemistry, Immunoprecipitation, Immune cell isolation, Lymphocyte Count from Blood

5. Cancer biology: Cancer biology: Classification and Nomenclature, Signs and symptoms, Causes of cancer: Chemical carcinogens, Ionizing radiation, Infectious diseases, Hormonal imbalances, Immune system dysfunction, Heredity, Other causes. Pathophysiology of cancer: Epigenetics, Oncogenes, Tumor suppressor genes, cell signalling and cancer. Cancer cell biology: Clonal evolution, Biological properties of cancer cell. Therapeutics: Antiangiogenesis, immunotherapy, Oncogenic Viruses

6. Human Physiology - Review of structure of gastrointestinal tract and accessory organs. Secretory, Digestive and absorptive function of GIT. Role of Liver, Pancreas and gall bladder and their dysfunction. Hormones of GIT. Mechanism of absorption of carbohydrates, Proteins and fats. Review of structure and function of endocrine glands. Mechanism of hormonal action. Control of hormonal secretion. Function and different syndromes resulting from hypo and hyper secretion of Endocrine gland mainly Pituitary, Adrenal, Thyroid, Ovary, Testes, Pancreas, Parathyroid. Basics of Immunology, Reproductive Biology and its modification in male and female climacteric