

Syllabus for the post of
Microbiologist (Specialist Service), Class-I (Advt-No-26/2024-25)

Marks – 200

Questions – 200

Medium – English

1. GENERAL MICROBIOLOGY

History of microbiology, Microscopy, Bio-safety including universal containment, personal protective equipment for biological agents, Physical and biological containment, Isolation precautions including standard precautions and transmission based precautions, Sterilization, disinfection and lyophilization, Morphology of bacteria and other microorganisms, Nomenclature and classification of microorganisms, Normal flora of human body, Growth and nutrition of bacteria, Bacterial metabolism, Bacterial toxins, Bacteriocins, Microbiology of hospital environment, Microbiology of air, milk and water, Host-parasite relationship, Antimicrobial agents and mechanisms drug resistance, Bacterial genetics and bacteriophages, Molecular genetics relevant for medical microbiology, Quality assurance and quality control in microbiology, Accreditation of laboratories.

2. IMMUNOLOGY

Components of immune system, Innate and acquired immunity, Cells involved in immune response, Antigens, Immunoglobulins, Mucosal immunity, Complement, Antigen and antibody reactions, Hypersensitivity, Cell mediated immunity, Cytokines, Immunodeficiency, Auto-immunity, Immune tolerance, MHC complex, Transplantation immunity, Tumor immunity, Vaccines and immunotherapy, Measurement of immunological parameters, Immunological techniques, Immunopotential and immunomodulation.

3. SYSTEMATIC BACTERIOLOGY

Isolation and identification of bacteria, Gram positive cocci of medical importance including *Staphylococcus*, *Micrococcus*, *Streptococcus*, *anaerobic cocci* etc., Gram negative cocci of medical importance including *Neisseria*, *Branhamella*, *Moraxella* etc., Gram positive bacilli of medical importance including *Lactobacillus*, *Coryneform organisms*, *Bacillus* and *aerobic bacilli*, *Actinomyces*, *Nocardia*, *Actinobacillus* and other *actinomycetales*, *Erysipelothrix*, *Listeria*, *Clostridium* and other spore bearing anaerobic bacilli etc., Gram negative bacilli of medical importance including *Vibrios*, *Aeromonas*, *Plesiomonas*, *Haemophilus*, *Bordetella*, *Brucella*, *Gardnerella*, *Pseudomonas* and other non-fermenters, *Pasteurella*, *Francisella*, *Bacteroides*, *Fusobacterium*, *Leptotrichia* and other anaerobic gram negative bacilli etc., *Helicobacter*, *Campylobacter*, *Calymmatobacterium*, *Streptobacillus*, *Spirillum* and miscellaneous bacteria, *Enterobacteriaceae*, *Mycobacteria*, *Spirochaetes*, *Chlamydia*, *Mycoplasmatales*; *Mycoplasma*, *Ureaplasma*, *Acholeplasma* and other *Mycoplasmas*., *Rickettsiae*, *Coxiella*, *Bartonella* etc.

4. MYCOLOGY

General characteristics and classification of fungi, Morphology and reproduction of fungi, Isolation and identification of fungi, Tissue reactions to fungi, Yeasts and yeast like fungi, of medical importance including *Candida*, *Cryptococcus*, *Malassezia*, *Trichosporon*, *Geotrichum*, *Saccharomyces* etc., Mycelial fungi of medical importance including *Aspergillus*, *Zygomycetes*, *Pseudallescheria*, *Fusarium*, *Piedra*, other *dematiaceous hyphomycetes* and other *hyalohyphomycetes* etc., Dimorphic fungi including *Histoplasma*, *Blastomyces*, *Coccidioides*, *Paracoccidioides*, *Sporothrix*, *Penicillium marneffe* etc., *Dermatophytes*, Fungi causing Mycetoma, Chromoblatomycosis, Occulomycosis and Otomycosis, *Pythium insidiosum*, *Prototheca*, *Pneumocystis jirovecii* infection, *Rhinosporidium seeberi* and *Lacazia loboi* (*Loboa loboi*), Laboratory contaminant fungi, Mycetism and mycotoxicosis, Antifungal agents and in vitro antifungal susceptibility tests.

5. VIROLOGY

General properties of viruses, Classification of viruses, Morphology: Virus structure, Virus replication, Isolation and identification of viruses, Pathogenesis of viral infections, Genetics of viruses, DNA viruses of medical importance including Pox viruses, Herpes viruses, Adeno viruses, Hepadna virus, Papova and Parvo viruses etc., RNA viruses of medical importance including Enteroviruses, Toga viruses, Flavi viruses, Orthomyxo viruses, Paramyxo viruses, Reo viruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human immunodeficiency virus, Arbo viruses, Corona viruses, Calci viruses etc., Slow viruses including prions, Unclassified viruses, Hepatitis viruses, Viriods, prions, Vaccines and anti-viral drugs.

6. PARASITOLOGY

General characters and classification of parasites, Methods of identification of parasites, Protozoan parasites of medical importance including *Entamoeba*, *Free living amoebae*, *Giardia*, *Trichomonas*, *Leishmania*, *Trypanosoma*, *Plasmodium*, *Toxoplasma*, *Sarcocystis*, *Cryptosporidium*, *Microsporidium*, *Cyclospora* *Isospora*, *Babesia*, *Balantidium*, etc., Helminthology of medical importance including those belonging to Cestoda (*Diphyllobothrium*, *Taenia*, *Echinococcus*, *Hymenolepis*, *Dipylidium*, *Multiceps* etc.), Trematoda (*Schistosomes*, *Fasciola*, *Fasciolopsis*, *Gastrodiscoides*, *Paragonimus*, *Clonorchis*, *Opisthorchis* etc.) and Nematoda (etc.). Entomology: common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis. Vector control agents, Anti-parasitic agents.

7. APPLIED MICROBIOLOGY

Epidemiology of infectious diseases, Antimicrobial prophylaxis and therapy, Hospital acquired infections, Management of biomedical waste, Investigation of an infectious outbreak in hospital and community, Infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections,

reproductive tract infections, gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc., Opportunistic infections. Sexually transmitted diseases. Vaccinology: principles, methods of preparation, administration of vaccines types of vaccines, Information technology (Computers) in microbiology, Automation in Microbiology, Molecular techniques in the laboratory diagnosis of infectious diseases, Statistical analysis of microbiological data and research methodology, Animal and human ethics involved in microbiological work., Safety in laboratory and Laboratory management

8. CURRENT TRENDS AND RECENT ADVANCEMENTS IN MICROBIOLOGY.