

SHRI SHIVAJI SCIENCE AND ARTS COLLEGE, CHIKHLI (DIST. BULDANA)
DEPARTMENT OF MICROBIOLOGY
B.Sc. II (4 S-Microbiology)

Paper - Medical Microbiology

The examination shall comprise of two theory papers, one in each semester and one practical in each semester. Each theory paper will be of 3 hours duration and carry 80 marks. The internal assessment will carry 20 marks. The practical examination will be of at least 4 hours duration in one day and shall carry 50 marks. The following syllabus is prescribed on the basis of six lectures per week and 6 practical periods per batch per week. Each theory paper has been divided into 6 units. There shall be one question on every unit with internal choice for each of 12 marks & one compulsory question covering all the syllabus of semester-IV (8 Marks).

Unit I: Epidemiology

- a) Definition, classification and scope of epidemiology.
 - b) Infection- Types of infection and modes of transmission.
 - c) Normal flora of human body.
 - d) Infection process, pathogen city and virulence, Microbial virulence factors: toxins, enzymes.
- Control of communicable diseases.

Unit II: Immunology

- a) Organs and cells of immune system
- b) General Nonspecific factors- Physiological barriers, Natural cellular factors, Natural humoral factors.
- c) Immunity- Definition and classification
- d) Innate immunity- Species, Racial, Individual, Herd immunity.
- e) Acquired immunity- Active and passive immunity,
- f) Immune response and hypersensitivity

Unit III: Serology

- a) Antigens- Definition, types and factors determining antigenicity, Bacterial antigens.
 - b) Antibodies- Definition, Structure, classification, Properties and differences, Monoclonal antibodies.
- Antigen Antibody reactions- Agglutination, Precipitation, Complement fixation test, ELISA and RIA.

Unit IV: Pathogenic Bacteria

Study of following bacteria with respect to their morphology, cultural and biochemical properties, antigenic structure, pathogenesis, laboratory diagnosis and prophylaxis:

- a) *Staphylococcus aureus*.
- b) *Clostridium tetani*.
- c) *Salmonella typhi*.
- d) *Mycobacterium tuberculosis*.
- e) *Treponema pallidum*.

f) *Vibrio cholerae*.

Unit V: Other Pathogenic organisms

- a) Viruses- AIDS, Hepatitis, Polio, Rabies.
- b) Rickettsias- *R. prowazekii*
- c) Protozoa- *E. histolytica*
- d) Fungi-*C. albicans*

Unit VI: Antimicrobial chemotherapy

- a) Ideal characters of chemotherapeutic agents
- b) Major antimicrobial agents and its clinical uses:
 - i) Antibacterial agents: Rifampicin, Chloramphenicol, Streptomycin and Ciprofloxacin
 - ii) Antiviral agents: Azidothymidine, Amantadine.
 - iii) Antifungal agents: Griseofulvin, Amphotericin B, Imidazoles.
- c) Basic mechanism of antibiotic action
- d) Antimicrobial susceptibility testing: Introduction to CLSI (NCCLS), MIC. Disc diffusion, agar dilution, broth dilution (macro and micro).

Practicals

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1. Studies of microbial enzymes and biochemical tests:
 - a) Urease b) Coagulase c) Oxidase d) IMViC e) Sugar fermentation
2. Isolation and Identification of following bacteria:
 - a) *Staphylococcus aureus* b) *E. coli* c) *Salmonella typhi*
3. Serological Tests:
 - a) Widal b) Pregnancy test c) VDRL
4. Antibiotic sensitivity by Disc diffusion method.
5. Clinical investigations:
 - a) Blood grouping and Cross matching
 - b) TLC, DLC
 - c) Hemoglobin estimation
 - d) Test for carbohydrates and Proteins in Urine
 - e) Blood glucose and cholesterol
6. Cultural examination of Urine, Blood, Sputum, Stool, Pus, CSF.
7. Isolation of pathogenic fungi
8. Study Tour.

