EFFECTIVE FROM - JUNE - 2008

S. Y. B. Sc.

BIOSCIENCE Paper-III

CYTOLOGY, GENETICS & PHYSIOLOGY

A. CYTOLOGY

(a) Ultrastructure & functions of cell-organelles (eucaryotic) in detail.
  1. Cell membrane.
  2. Mitochondria.
  3. Chloroplast.
(b) Basic structure & functions of cell-organelles (eucaryotic) in brief.
  1. Golgi apparatus.
  2. Endoplasmic reticulum.
  3. Ribosome
(c) Nucleus & Chromosomes
(d) Cell cycle & cell division.

B.GENETICS

(a) Gene concept.
  1. Morgan's classical gene concept.
  2. Modern gene concept.
(b) 1. DNA as hereditary material.
  2. DNA replication.
  3. Genetic code & template theory.
(c) Chromosomal abnormalities & Sex-link inheritance.
  (Haemophilia, colour blindness)
(d) Multiple allele: ABO & Rh blood group.

C.PHYSIOLOGY

(a) 1. Blood constituent-Blood plasma & cells.
  2. Types & functions of blood cells.
(b) 1. Structure, functions & types of haemoglobin.
  2. Transport of Oxygen & Carbon dioxide.
  3. Blood coagulation & Blood pressure.
(c) Temperature regulation in human body.
  1. Normal human body temperature.
  2. Heat exchange between body & environment.
  3. Central mechanism regulates body temperature.
(d) Regulation of body fluids & electrolytes.
  1. Osmotic & solutes requirement.
  2. Osmo-regulation in human.
  3. Water balance, Na/balances.

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BIOSCIENCE Paper-IV

BIOCHEMISTRY, BIOPHYSICS & INSTRUMENTATION, BIOSTATISTIC

A. BIOCHEMISTRY

(a) Carbohydrates.
1. Introduction, natural occurrence & physiological importance.
2. Classification: aldoses & ketoses, Mono.Di. & Polysaccharides.
3. Physical properties of carbohydrates, asymmetrical carbon atom, sterioisomerism & optical isomerism.
4. Configuration in Sugar: Linear & Ring structure.

(b) Amino acids & Proteins.
1. Introduction to amino acids, peptide linkage, proteins.
2. Essential amino acids, structure & importance.
3. Classification of proteins.

(c) Fatty acids & lipids.
1. Introduction & classification of lipids.
2. Fatty acids - saturated & unsaturated.
3. Trigyceride, Phospholipids, glycolipid, lipoprotein, steroids.

(d) Nucleic acids.
1. Introduction, nucleoside, nucleotide.
2. DNA structure & importance.
3. RNA structure & types.

(e) Enzymes
1. Characteristics, nomenclature, classification.
2. Enzyme specificity, factors affecting enzyme activity
3. Coenzymes, cofactors.

B. BIOPHYSICS & INSTRUMENTATION

(a) Electromagnetic spectrum.
(b) Colloids & colloidal system.
(c) Radioactivity, radioisotopes, their uses & radiation hazards
(d) Introduction, principle, operational technique of pH meter & photoelectric colorimeter, electrophoresis.
(e) Chromatographic technique - paper, TLC

C. BIOSTATISTIC

(a) Introduction to biostatistic, data, table & frequency, statistical averages; mean, mode, median.
(b) Random sampling, standard error, test of significance.
(c) Variation, standard deviation, normal distribution study, normal curve, probability.
(d) Chi-square test
(e) Graphical representation of statistical data.

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BIOSCIENCE Paper-V

MICROBIOLOGY

1. History & scope of Micro biology
   Introduction to microbiology, origin of microbes, contribution of scientists, scope of microbial science

2. Diversity of microbial world
   Outline classification of microbes, general aspect of protists, yeast & fungi. Important features of some bacterial groups/families. Viruses - Introduction & general characteristics, structure

3. Microscopy & staining techniques
   Microscope, types of microscopy, dyes - stains, Mordant, intensifier, decolorizer & stainng techniques.

4. Procaryotic cell structure function.
   Cell wall, membrane, flagella, ribosome, endospore, capsule, pilli, cytoplasmic granules

5. Microbial nutrition
   Nutritional requirement & types, culture media, Isolation of pure culture, anaerobic cultivation, preservation & maintenance

6. Microbial growth
   Generation time, growth curve, factors affecting growth, measurement of growth

7. Microbial control by physical & chemical agent
   Antiseptic, disinfectant, sanitizer, sterilization by Physical (heat, filtration, radiation) & chemical agent

8. Normal microbial flora.
   Normal flora of skin, oral cavity, eyes, RT, AT, UGT,

9. Pathogenisity of microorganism
   Entery of pathogen, infection & types, virulance, factors effecting virulance, attenuation exaltation, types of pathological condition, types of diseases

10. Introduction to immunology
    Cells, tissues & organs of immune system, Immunity (innate & acquired), host defence mechanism, Antigen/immunogen & antibody/immunoglobulin

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S. Y. B. Sc. BIOSCIENCE

Practical: Paper III & IV

1. Determination of blood groups.
2. RBC counting.
3. WBC counting.
4. Differential counts (DC).
5. Estimation of haemoglobin by Sahli's method.
6. Preparation of hemin crystals.
7. Measurement of blood pressure.
8. Determination of clotting time by capillary method.
9. Nucleus & nucleolus staining from onion peel.
10. Preparation of mitotic chromosome from onion root tip.
11. Introduction to principle & operational technique of photoelectric colorimeter. (Demonstration)
12. Introduction to principle & operational technique of electrophoresis. (Demonstration)
13. Unidimentional paper chromatography of amino acids.
14. Unidimentional paper chromatography of unknown aminoacid mixture.
15. Qualitative determination of monosaccharides.
16. Qualitative determination of disaccharides.
17. Qualitative determination of polysaccharides.
18. Qualitative determination of protein.
19. Qualitative determination of unknown solution.
20. Preparation of normal, molar, molal, % solutions.
21. Study of permanent slides & specimens as per theory paper III & IV.

Practical: Paper V (Special paper)

1. Demonstration of laboratory apparatus.
2. Cleaning & preparation of glassware for sterilization.
3. Introduction to microscope & microscopic examination of natural infusion by hanging drop preparation, wetmount preparation.
4. Simple & negative staining.
5. Gram's staining.
6. Acidfast staining by ZNCF method.
7. Spirochete staining by Fontana's method.
8. Cellwall staining by Chance's/Ringer's method.
9. Capsule staining by Maneval's method.
10. Endospore staining by Dorner's method.
11. Volutin granule staining.
12. Preparation of culture media.
13. Preparation of biochemical media.
14. Study of biochemical reaction.
15. Determination of growth phase of *E.coli* by colorimetric.
16. Effect of some physical agents on bacterial growth.
17. Effect of some chemical agents on bacterial growth.
18. Pure culture study of gram –ve bacteria; *E. coli, Enterobacter aeroginus, Klebseilla pneumonae, Serretia marcesence.*
19. Pure culture study of gram +ve bacteria; *Bacillus megaterium, Bacillus subtilis, Bacillus cerus, Staphylococcus aureus.*
20. Study of permanent slides & specimens as per theory paper V.

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S. Y. B. Sc. BIOSCIENCE

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1. Cell & Molecular Biology. By Sheeler and Bianchi.
   Pub. Biley Pub. Delhi.
2. Cytology and Genetics. By Sem and Kar.
   Pub. Norosa Pub.
3. Cell & Molecular Biology. By De Robertis & De Robertis
   Pub. K.M. Varghese Co. Mumbai
4. Cytology by P.S.Agrawal.
   Pub. S.Chand & Co. Ltd
5. General Genetic, By R. Edgar.
   Pub. Eurasia Pub, House Pvt. Ltd. New Delhi.
6. Genetics. By A. M. Winchester.
   Pub. Oxford Publication; New Delhi.
7. Genetics. by Arora and Sundhu.
   Pub. Himalaya Publishing House, New Delhi.
8. Clinical Haematology by M. Wintrobes
   Pub. Pub. K.M. Varghese Co. Mumbai
9. Harper's Review of Biochemistry. By Martin, Mayes and Rodwell.
   Pub. Lange Medical
10. Hand Book of Experimental Physiology & Biochemistry. By P. V. Chanda.
    Pub. Jay Pee Bro. Med. Pub.
11. Practical Biochemistry. By Plumner
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12. Biophysics Concepts & Mechanism. By Casey.
    Pub. Affiliated East West Agency pvt. Ltd.
13. Biostatistics By A. Lecois.
    Pub. Affiliated East West Agency pvt. Ltd.
14. Methods in Biostatistics. By B. K. Mahajan.
    Pub. Jay Pee Bro. Med. Pub.
15. Text Book of Preventive and social Medicine. By Park and Park.
    Pub. Banarasidas Bhanot.
16. General Microbiology. Vol. I & II By Daginawala and Powar.
    Pub. Himalaya Publishing House, Mumbai.
17. Fundamental Principles of Bacteriology. By Salle.
    Pub. Tata McGrawhill Pub. New York.
18. Experimental Microbiology. By R.J.Patel.
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19. Microbiology. By Pelzar, Chan, Krieg.
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20. Text book of Medical Microbiology. By Anantnarayan
    Pub. Tata McGraw Hill Pub. New Delhi.
21. Elementary Microbiology. By Dr. H. A. Modi
    Pub. Ekta prakashan.