

KAKATIYA UNIVERSITY
B.Sc. Final Year (Under CBCS)
SEMESTER – V
(SEC-3) Skill Enhancement Course-III
(FOR ALL SCIENCE FACULTY DEPARTMENTS)

VERBAL REASONING FOR APTITUDE TEST

Credits: 2

Theory: 2 hours/week

Marks - 50

Unit – I NUMBERS AND DIAGRAMS

1.1 Series Completion: Number series, Alphabet Series

1.2 Series Completion: Alpha Numeric Series, Continuous Pattern Series

1.3 Logical Venn Diagrams

1.4 Mathematical Operations: Problem solving by substitution, Interchange of signs and numbers

Unit – II ARITHMETICAL REASONING

2.1 Mathematical Operations: Deriving the appropriate conclusions

2.2 Arithmetical Reasoning: Calculation based problems, Data based problems

2.3 Arithmetical Reasoning: Problems on ages, Venn diagram based problems

2.4 Cause and Effect Reasoning

Text Book: A Modern Approach to Verbal & Non-Verbal Reasoning by Dr. R.S.Aggarwal

KAKATIYA UNIVERSITY
B.Sc. Final Year (Under CBCS)
SEMESTER – V
(GE-1) GENERIC ELECTIVE-I
(FOR ALL SCIENCE FACULTY DEPARTMENTS)

PUBLIC HEALTH AND HYGIENE

Credits: 2

Theory : 2 hours/week

Marks: 50

UNIT – I : NUTRITION AND ENVIRONMENT

- 1.1 Balanced diet and Malnutrition.
- 1.2 Nutritional deficiencies and disorders- Carbohydrates, proteins, lipids, vitamins and minerals.
- 1.3 Occupational, Industrial, agricultural and urban Health-Exposure at work place, urban areas, industrial workers, farmers and agricultural labourers, Health workers and health disorders and diseases.
- 1.4 Environmental pollution and associated Health hazards, Water borne diseases and Air borne diseases.

UNIT-II : DISEASES AND HEALTH CARE

- 2.1 Causes, Symptoms, Diagnosis, Treatment and Prevention - Malaria, Filariasis, Measles, Polio, Chicken pox, Rabies, Plague, Leprosy,.
- 2.2 Causes, Symptoms, Diagnosis, Treatment and Prevention of non communicable diseases - Hypertension, Coronary Heart diseases, Stroke, Diabetes, Obesity and Mental ill-health.
- 2.3 Health care legislation in India – Termination of pregnancy act, Maternity benefit act, Biomedical waste act, ESI act.
- 2.4 First Aid and Health awareness, personal health care record maintenance.

KAKATIYA UNIVERSITY
U.G. BIOCHEMISTRY (Under CBCS)
B.Sc. Final Year (DSC-1E)
SEMESTER - V

Paper-V Nutrition and Clinical Biochemistry

Unit I

- 1.1. Balanced diet. Calorific values of foods and their determination by Bomb calorimeter. BMR and factors affecting it. Specific dynamic action of foods.
- 1.2. Energy requirements and recommended dietary allowance (RDA) for children, adults, pregnant and lactating women.
- 1.3. Sources of complete and incomplete proteins. Biological value of proteins. Role of essential fatty acids in human nutrition.
- 1.4. Malnutrition, PEM – Kwashiorkor, Marasmus. Obesity and starvation.

Unit II

- 2.1. Vitamins-sources, structure, biochemical roles,
- 2.2. Deficiency disorders of water and fat soluble vitamins.
- 2.3. Introduction to nutraceutical and functional foods.
- 2.4. Minerals in Nutrition- Macro & Micro elements-Ca, Mg, Fe, I, Cu, Mo, Zn, Se and F.

Unit III

- 3.1. Plasma proteins in health and disease. Disorders of blood coagulation (Haemophilia). Types of anemias, Haemoglobinopathies -sickle cell anemia and Thalassemias.
- 3.2. Structure and functions of the liver. Liver diseases-jaundice, hepatitis, cirrhosis.
- 3.3. Liver function tests- conjugated and total bilirubin in serum, albumin : globulin ratio, Hippuric acid and bromsulphthalein tests.
- 3.4. Serum enzymes in liver diseases-SGPT, SGOT, GGT and alkaline phosphatase.

Unit IV

- 4.1. Kidneys-structure of nephron, urine formation, normal and abnormal constituents of urine.
- 4.2. Biological buffers. Role of kidneys in maintaining acid-base and electrolyte balance in the body.
- 4.3. Renal function tests – creatinine and urea clearance tests, phenol red test.
- 4.4. Biochemical tests for the diagnosis of heart diseases-HDL/LDL cholesterol, SGOT, LDH, CK, C-reactive protein, cardiac troponins.

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U.G. BIOCHEMISTRY (Under CBCS)
B.Sc. Final Year (DSC-1E)
SEMESTER - V

Paper-V Nutrition and Clinical Biochemistry (PRACTICAL)

CREDITS: 1

MAXIMUM MARKS: 25

1. Estimation of sodium by flame photometry.
2. Isolation of total lipids by Gravimetric method.
3. Estimation of Hemoglobin by CMG method..
4. Total count – RBC and WBC. Differential count.
5. Qualitative Analysis of abnormal Urinary constituents (Albumin, sugars , ketone bodies & blood)
6. Estimation of serum creatinine.
7. Estimation of Blood urea.
8. Estimation of serum cholesterol.
9. Estimation of serum Glucose by glucose oxidase –peroxidase method.
10. Determination of serum Alkaline phosphatase activity.
11. Determination of SGOT and SGPT activity.

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U.G. BIOCHEMISTRY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER - V
ELECTIVE
A. BASIC MICROBIOLOGY

CREDITS: 3

MAXIMUM MARKS:

Unit I - History of Development of Microbiology

- 1.1. Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming to microbiology
- 1.2. Role of microorganisms in fermentation, Germ theory of disease,
- 1.3. Development of various microbiological techniques and golden era of microbiology,
- 1.4. Establishment of fields of medical microbiology and immunology through the work of Paul Ehrlich, Elie Metchnikoff, Edward Jenner

Unit II - Diversity of Microbial world

- 2.1. Binomial Nomenclature, Whittaker's five kingdom and Carl Woese's three kingdom classification systems and their utility.
- 2.2. Difference between prokaryotic and eukaryotic microorganisms.
- 2.3. General characteristics of different groups: acellular microorganisms (Viruses, Viroids, Prions) and Cellular microorganisms (Bacteria, Algae, Fungi and Protozoa)
- 2.4. Distribution and occurrence, morphology, mode of reproduction and economic importance of microorganisms..

Unit III - Viruses, viroids and prions

- 3.1. Virus – Structure and Function, replication, transmission, pathogenesis and diagnosis.
- 3.2. Viroids - Structure and Function, replication, transmission, pathogenesis and diagnosis.
- 3.3. Prions - Structure and Function, replication, transmission, pathogenesis and diagnosis.
- 3.4. viruses with special reference to the structure and replication of the following: Poxvirus, Poliovirus, HIV, T4 and phage, lytic and lysogenic cycles.

Unit IV - Bacteria and Fungi

- 4.1. An account of typical eubacteria, chlamydiae & rickettsiae (obligate intracellular parasites), mycoplasma, and archaeobacteria (extremophiles).
- 4.2. Applications of bacteria in industry, environment and food.
- 4.3. General characteristics of fungi including habitat, distribution and nutritional requirements, fungal cell ultra- structure, thallus organization and aggregation, fungal wall structure and synthesis, asexual reproduction, sexual reproduction, heterokaryosis, heterothallism and parasexual mechanism.
- 4.4. Economic Importance of Fungi in Agriculture, environment, Industry, medicine, food, biodeterioration, mycotoxins.

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U.G. BIOCHEMISTRY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER - V
ELECTIVE
A. BASIC MICROBIOLOGY (PRACTICALS)

CREDITS: 1

MAXIMUM MARKS: 25

1. Microbiology Laboratory Practices and Biosafety.
2. To study the principle and applications of important instruments (biological safety cabinets, autoclave, incubator, BOD incubator, hot air oven, light microscope, pH meter)
3. Preparation and sterilization of culture media for bacterial cultivation
4. Study of different shapes of bacteria, fungi, algae, protozoa using permanent slides pictographs
5. Staining of bacteria using Gram stain
6. Isolation of pure cultures of bacteria by streaking method.
7. Estimation of CFU count.

SUGGESTED READINGS

1. Atlas RM. (1997). Principles of Microbiology. 2nd edition. W M.T.Brown Publishers.
2. Pelczar MJ, Chan ECS and Krieg NR. (1993). Microbiology. 5th edition. McGraw Hill Book Company

U.G. BIOCHEMISTRY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER - V
ELECTIVE
B - TOOLS AND TECHNIQUES IN BIOCHEMISTRY

CREDITS: 3

MAXIMUM MARKS:

Unit-I:

- 1.1. Water as biological solvent and its role in biological processes, weak acids and bases, pH, Buffers, Henderson-Hasselbalch equation.
- 1.2. Membrane transport: Active and Passive transport, carrier proteins and their functions, reconstituted transport systems: Vesicles and liposomes.
- 1.3. Hydrodynamics of Biological molecules: Colloidal state, Viscosity, Diffusion, Osmosis, Donnan membrane equilibrium, Surface tension.

Unit-II:

- 2.1. Principles and applications of Chromatographic techniques
- 2.2. Paper Chromatography, Thin layer Chromatography (TLC) and Ion-Exchange Chromatography.
- 2.3. Principles and applications of HPLC and GC MS

Unit-III:

- 3.1. Colorimetry and Spectrophotometry: Electromagnetic radiation, interaction of light with matter (Fluorescence, phosphorescence, chemiluminescence).
- 3.2. Biochemical applications of Spectrophotometer. Beer-Lambert's law, UV and Visible absorption spectra, Molar extinction coefficient.
- 3.3. Centrifugation techniques: Basic principles and applications of centrifugation techniques: Differential, Density gradient, Ultracentrifugation, cell fractionation methods.

Unit-IV:

- 4.1. Electrophoresis: Principles and applications of Paper, Polyacrylamide (Native and SDS-PAGE) and Agarose gel Electrophoresis
- 4.2. Tracer techniques: Radioisotopes, Units of radioactivity, half life, and emitters and uses of radioisotopes in Biology.
- 4.3. Microscopes – light microscope, fluorescent microscope, TEM and SEM

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SEMESTER - V
ELECTIVE
B - TOOLS AND TECHNIQUES IN BIOCHEMISTRY (PRACTICALS)

CREDITS: 1

MAXIMUM MARKS: 25

1. Separation of Carbohydrates by Paper Chromatography.
2. Separation of Amino acids by Paper Chromatography.
3. Verification of Beer-Lambert's Law.
4. Absorption maxima of Proteins and Nucleic acids.
5. Separation of Serum Proteins by Paper Electrophoresis and PAGE.
6. Isolation of Photosynthetic pigments from leaf by TLC