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 :2hours/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, Filaria, 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. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSC-1E)
SEMESTER – V

Physiology and Biochemistry (Theory)

Max. Marks:

UNIT – I

1.1 Digestion definition; extra and intracellular digestion; Digestion of Carbohydrates, Proteins, Lipids and Cellulose.
1.2 Absorption and Assimilation of digested food; Role of Gastrointestinal hormones in digestion
1.3 Definition of Respiration and Respiratory mechanisms – External, Internal and cellular, Respiratory Pigment, Transport of oxygen, Oxygen dissociation curves. Bohr's effect, Transport of CO_2 – Chloride shift, Regulation of respiration – nervous and chemical.
1.4 Types of circulation - Open and Closed circulation; Structure of Mammalian Heart, Types of hearts – Neurogenic and Myogenic.
1.5Heart function – Conduction and regulation of heart beat, Regulation of Heart rate – Tachycardia and Bradycardia, Blood Clotting mechanism

UNIT – II

2.1 Classification of Animals on the basis of excretory products- Ammonotelic, Uricotelic, Ureotelic
2.2 Structure and function of Nephron; Urine formation, Counter current mechanism.
2.3 Types of Muscles; Ultra structure of skeletal muscle fibre; Sliding Filament theory, muscle contraction mechanism and energetics.
2.4 Structure of Neuron- Nerve impulse - Resting potential and Action potential and Conduction of Nerve impulse
2.5 Synapse, types of synapses and Synaptic transmission.

UNIT – III

3.1 Endocrine glands - Structure, secretions and functions of Pituitary, Thyroid, Parathyroid, Adrenal glands and Pancreas
3.2 Hormone action and concept of Secondary messengers, Male and Female Hormones, Hormonal control of Menstrual cycle in humans.
3.3 Concept and mechanism of Homeostasis.
3.4 Osmoregulation - Water and ionic regulation by freshwater, brackish water and marine animals
3.5 Enzymes: Definition, Classification, Inhibition and Regulation.

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

UNIT – IV

4.1. Carbohydrates**:** Classification and function of Carbohydrates
4.2. Carbohydrate metabolism - Glycolysis, Krebs cycle, , Electron transport and oxidative phosporelation.
4.3. Proteins**:** Classification of proteins based on functions and Chemical nature
4.4. Protein Metabolism - Transamination, Deamination and Urea Cycle
4.5. Lipids**:** Classifiation of Lipids, Lipid Metabolism - Fatty acid synthesis and Fatty acid oxidation.

Suggested readings:

1. **Gerard J. Tortora and Sandra Reynolds Garbowski** *Principles of Anatomy and Physiology*, Tenth Ed., John Wiley & Sons
2. **Arthur C. Guyton MD**, *A Text Book of Medical Physiology,* Eleventh ed., John E. Hall, Harcourt Asia Ltd.
3. **William F. Ganong**, *A Review of Medical Physiology*, 22 ed, McGraw Hill, 2005
4. **Sherwood, Klandrof, Yanc,** *Animal Physiology*, Thompson Brooks/Coole, 2005.
5. **Sherwood, Klandrof, Yanc,***Human Physiology*, Thompson Brooks/Coole, 2005.
6. **Knut Scmidt-Nielson,** *Animal Physiology***,** 5th ed, Cambridge Low Price Edition.
7. **Roger Eckert and Randal,** *Animal Physiology***,** 4th ed, Freeman Co, New York**.**
8. **Singh. H.R,** Text Book of Animal Physiology and Biochemistry
9. **Nagabhushanam,** Comparative Animal Physiology
10. **Veer Bal Rastogi,** Text Book of Animal Physiology

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

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

Physiology and Biochemistry (Practical)

Max. Marks: 25

1. Qualitative tests for identification of carbohydrates, proteins and lipids.
2. Qualitative tests for identification of ammonia, urea and uric acid (Nitrogenous excretory products)
3. Effect of pH and Temperature on salivary amylase activity.
4. Study of permanent histological sections of Mammalian Endocrine glands - pituitary, thyroid, pancreas, adrenal gland.
5. Estimation of Haemoglobin by Sahlis method.
6. Estimation of total protein by Lowry's method.
7. Estimation of unit Oxygen consumption of fish with reference to body weight.

- **Laboratory Record work shall be submitted at the time of practical examination**

- **Computer aided techniques should be adopted as per UGC guide lines.**

Suggested manuals

Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
Guyton, A.C. and Hall, J.E. (2011). T*extbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H Freeman and Co.
Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

KAKATIYA UNIVERSITY
U.G. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER – V

Elective

A) Applied Zoology (Theory)

Max. Marks:

UNIT – I

1.1.Types of Fisheries, culture of Fresh Water Fish and Prawn
1.2. Fresh water fishing gears and crafts; Induced Breeding.
1.3. Hatchery design and Management of fish and prawn, Transportation of fish and prawn seed.
1.4 Preservation, Processing and By-products of fishes.
1.5 Fish Diseases and control measures

UNIT – II

2.1. Life cycle of *Bombyx mori*
2.2 Structure of silk gland and secretion of silk
2.3 Silkworm rearing technology, Spinning, harvesting and storage of cocoons.
2.4 Silk worm Pests and Diseases: Uzi fly; Protozoan, Viral, Fungal and Bacterial; Control and prevention.
2.5 Prospects of Sericulture in India

UNIT – III

3.1 Selection of Bee Species for Apiculture. Bee Keeping Equipment.
3.2 Methods of Extraction of Honey (Indigenous and Modern).Bee Diseases and Enemies.
3.3 Products of Apiculture Industry and its Uses (Honey, Bees Wax).
3.4 Introduction of Vermiculture and Vermicomposting. Vermiculture techniques. Bedding, Essential parameters for Vermiculture and Management
3.5 Methods of Harvesting (Manual & Mechanical). Economic Importance of Vermiculture.

UNIT – IV

4.1. Classification of Fowls based on their use – Broilers and Commercial layers.
4.2. Principles of poultry breeding, Management of breeding stock and broilers, Processing and preservation of eggs.
4.3. Poultry diseases - Viral, Bacterial, Fungal, Protozoan
4.4. Management of a modern Poultry Farm, progressive plans to promote Poultry as a Self-Employment venture
4.5. Dairy farm and its management**,** Animal Husbandry – Introduction, Preservation of semen, artificial insemination of cattle, Induction of early puberty and synchronization of estrus in cattle.

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

Suggested Readings:

1. **Prost, P. J. (1962).** *Apiculture*. Oxford and IBH, New Delhi.
2. **Bisht. D.S.,** *Apiculture*, ICAR Publication.
3. **Singh S.,** *Beekeeping in India*, Indian council of Agricultural Research, NewDelhi.
4. **Ullal S.R. and Narasimhanna, M.N.** Handbook of Practical Sericulture: CSB,Bangalore
5. **Jolly. M. S.** Appropriate Sericultural Techniques; Ed., Director, CSR & TI, Mysore.
6. Handbook of Silkworm Rearing: Agriculture and Technical Manual-1, Fuzi Pub. Co.
7. **Narasimhanna**, **M. N.** Manual of Silkworm Egg Production;, CSB, Bangalore 1988.
8. **Wupang—Chun and Chen Da-Chung**, Silkworm Rearing;, Pub. By FAO, Rome 1988.
9. **Sengupta**, **K.** A Guide for Bivoltine Sericulture; Director, CSR & TI, Mysore 1989.
10. **Krishnaswamy**, **S.** Improved Method of Rearing Young age silkworm;CSB,Bangalore,1986.
11. **Jhingran. V.G.** Fish and fisheries in India.,
12. **Khanna. S.S,** An introduction to fishes
13. **Santanam, B.** ***et al***, A manual of freshwater aquaculture,
14. **Boyd. C.E. & Tucker.C.S**, Pond aquaculture water quality management,
15. **Biswas.K.P,** Fish and prawn diseases,
16. **Hafez, E. S. E. (1962)**. *Reproduction in Farm Animals*. Lea & Fabiger Publisher
17. **Dunham R.A. (2004).** *Aquaculture and Fisheries Biotechnology Genetic Approache*s. CABI
18. **Pedigo, L.P. (2002)**. *Entomology and Pest Management*, Prentice Hall.
19. **Lee,** Earthworm Ecology
20. **Stevenson,** Biology of Earthworms

Ranganathan L.S, Vermicomposting technology- soil health to human health.

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

KAKATIYA UNIVERSITY
U.G. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER – V

Elective

A) Applied Zoology (Practical)

Max. Marks: 25

1. Identification and study of important cultivable and edible fishes - Any five
2. Identification and study of important cultivable and edible crustaceans - Any five
3. Identification different larvae of silk worm- Using specimens / pictures
4. Identification of mulberry and non mulberry silkworms
5. Mounting of mouth parts of adult silk worm and silk gland of larva
6. Estimation of quality of milk from different dairy farm units – specific gravity, fat content, pH viscocity.
7. Identification of purity of Honey in different samples
8. Field visits to a Vermiculture / Sericulture / fisheries / apiculture / poultry / dairy farm- submission of any 3 Reports

- **Laboratory Record work shall be submitted at the time of practical examination**

- **Computer aided techniques should be adopted as per UGC guide lines.**

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

KAKATIYA UNIVERSITY
U.G. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER – V

Elective

B) Food and Nutrition (Theory)

Max.Marks:

Unit-I: Food Science & Community Nutrition

1. I Basic concept of food & Nutrition; Classification of Food and Nutrients; Requirement and Functions of Proteins, Lipids and Carbohydrates in diet.

1.2 Water - Functions, daily requirements, Water balance; Dietary Fibre sources & nutritional Significance.

1.3 Elementary idea of Probiotics, Prebiotics, Organic Food.

1.4 Life style related diseases - hypertension, diabetes mellitus and obesity (causes and prevention through dietary and life style modifications).

Unit-II: Nutritional Biochemistry & Diet Therapy

2.1 Vitamins - Chemistry and biochemical role of fat soluble vitamins. A. D. E. and K. Water Soluble vitamins - Bl, B2, B6, niacin and C.

2.2 Minerals - Biochemical role of inorganic elements

2.3 Therapeutic adaptations of normal diet, principles and classification of the therapeutic diets.

2.4 Dietary care and management in - Viral Hepatitis, Cirrhosis of liver, Dietary care and Management in diseases of Gall Bladder and Pancreas

.

Unit-III: Food Microbiology

3. l Cultivation of microorganisms, Nutritional requirements of micro-organisms, types of media Used, methods of isolation,

3.2 Introduction to important organisms in foods; Methods for destruction of microorganism in Foods.

3.3 Causes, treatment & Prevention of social health problems-smoking, alcoholism, drug Dependence and Acquired Immunodeficiency Syndrome (AIDS).

3.4 Food Spoilage-Contamination and microorganisrns in the spoilage of different kinds of foods; food and water borne infections and intoxications.

Unit-IV: Human Nutrition

4.1 Health and Dimension of Health- Positive health versus absence of disease,

4.2 Immunization: Importance and schedule of Immunization for children, adults and for foreign travels, role of individual, family and community in promoting health.

4.3 Concept and definition of terms - Nutrition, Malnutrition and Health, Minimum Nutritional Requirement and RDA - Formulation of RDA and Dietary Guidelines Reference Man and Reference Woman,

4.4 Energy Balance, Assessment of Energy Requirements-deficiency and excess, Determination of Energy in food, B.M.R. and its regulation'

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

KAKATIYA UNIVERSITY
U.G. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER – V

Elective

B) Food and Nutrition (Practical)

Max.Marks:25

1. Identification of Mono, Di and Polysaccharides'

2. Identification of Proteins (albumin' gelatin, peptone)'

3. Determination of Acid value, saponification value of fats and oils.

4. Estimation of Lactose in Milk

5. Estimation of serum Protein (Biuret method and Lowry method)

6. Estimation of blood Glucose (Folin Wu method)'

7. Estimation of Ascorbic acid.

8. Estimation of blood creatinine.

9. Visit to canning industry and dairy firm etc.

10. Planning and preparation of low fat and low caloric diets.

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

KAKATIYA UNIVERSITY
U.G. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER – V

Elective

C) Bioinstrumentation (Theory)

Max.Marks:

Unit-I: Microscopy and Basic Instrumentation

1.1 Microscopy, principle & applications - Light microscope and phase contrast microscope.
1.2 Principles and applications of Fluorescence microscope, Electron microscope.
1.3 General Principle and applications of pH meter, Colorimeter, Spectrophotometer.
1.4 Beer and Lambert.s law.

Unit II: Separation techniques

2.1 Chromatography, principle type and applicants.
2.2 Electrophoresis, principles, types and applications PAGE and agarose gel electrophoresis
2.3 Organelle separation by centrifugation.
2.4 Ultracentrifugation.

Unit III: Cytological Techniques

3.1 Cytological techniques - Chromosome banding techniques (G.C.Q. R. banding), Flowcytometry.
3.2 Design and functioning of tissue culture laboratory- Autoclave, laminar flow, co2 Incubator, inverted microscope.
3.3 Cryotechniques - cryopreservation of cells, tissues, organs and organisms.
3.4 Histological techniques - Principles of tissue fixation - Microtomy, Staining, Mounting, Histo-chemisty

Unit IV: Molecular Biology Techniques

4.1 Southern hybridization and Northern hybridization
4.2 DNA Sequencing and Polymerase chain reaction (PCR)
4.3 Autoradiography.
4.4 Immunodiffusion and Immuno electrophoresis.

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)

KAKATIYA UNIVERSITY
U.G. ZOOLOGY (Under CBCS)
B.Sc. Final Year (DSE-1E)
SEMESTER – V

Elective

C) Bioinstrumentation (Practical)

Max.Marks:25

l. Comments upon the structure and application of analytical instruments:

Microscopes, Colorimeter,

2. Demonstration of instruments: Spectrophotometer, Ultracentrifuge, Microtome

3. Demonstration of counting of cells (blood and protozoan) by haemocytometer,

haemoglobinometer, pH meter.

4. Microbiological Techniques: Media Preparation and sterilization, inoculation and Monitoring.

5. Demonstration of cell culture facilities.

6. Demonstration of PCR

7. Demonstration of SDS-PAGE, Agarose Gel Electrophoresis.

Suggested Readings;

1. Introduction to instrumental analysis-Robart Braun-McGraw Hill.
2.A biologist Guide to principles and Techniques of Practical Biochemistry K, Wilson and K.H.Goulding EBIS Edn
3.Clark & Swizer , Experimental Biochemistry Freeman" 2000
4.Locquin and Langeron. Handbook of Microscopy. Butterwaths, 1983
5.Boyer. Modern Experimental Biochemistry' Benjamin.1993
6. Freifelder. Physical Biochemistry. Freeman, 1982.
7, Wilson and Wlaker. Practical Biochemistry. Cambridge, 2000.
8. Cooper. The Cell-A Molecular Approach. ASM, 1997
9. John R,W. Mastprs, Animal Cell cultures- A practical approach. IRL Press,
10. Robert Braun. Introduction to instrumental analysis. McGraw Hill

Prof. T. RAVINDER REDDY
Chairman ,BOS
Department of Zoology
KAKATIYA UNIVERSITY, WGL-506 009 (T.S)