

KAKATIYA UNIVERSITY
U.G. Skill Enhancement Course - IV
(Under CBCS)
B.Sc. Final Year
SEMESTER - VI
(FOR ALL SCIENCE FACULTY DEPARTMENTS)

QUANTITATIVE APTITUDE TEST

Credits: 2

Theory: 2 hours/week

Marks - 40

Unit – I ARITHMETICAL ABILITY

1.1 Arithmetical Ability: Ratio & Proportion

1.2 Arithmetical Ability: Time & Work, Time & Distance

1.3 Arithmetical Ability: Simple Interest, Compound Interest

1.4 Arithmetical Ability: Stocks & Shares

Unit – II DATA INTERPRETATION

2.1 Data Interpretation: Tabulation

2.2 Data Interpretation: Bar Graphs

2.3 Data Interpretation: Pie Charts

2.4 Data Interpretation: Line Graphs

Text Book: Quantitative Aptitude by Dr. R.S.Aggarwal

KAKATIYA UNIVERSITY
U.G. B.Sc. Final Year (Under CBCS)
Semester – VI: Generic Elective Paper-II
(FOR ALL SCIENCE FACULTY DEPARTMENTS)

WATER RESOURCES MANAGEMENT

UNIT-I

1. Importance of Natural Resources – Different Types Resources
2. Significance of Water Resources and their uses
3. Conservation of water and recycling of the water – Global distribution of water
4. Water shed programmes and their management
5. Storing the rain water in tanks and recharging ground water.

Unit-II

6. Rain water harvesting in rural areas (chekdam, trenches etc.,)
7. Over use of surface and ground water and control measures.
8. Aims, objectives and implementation of Mission Bhagiratha (Telangana Government Drinking water programme)
9. Aims, objectives and implementation of Mission Kakatiya (Telangana Government minor irrigation programme)
10. Issues and challenges in Water Resources Management



Prof. T. RAVINDER REDDY

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

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B.Sc. Final Year (DSC-1F)
SEMESTER – VI

Immunology and Animal Biotechnology (Theory)

Max. Marks: 60

UNIT – I

- 1.1. Basic concepts of immunology. Cells of immune system Primary and secondary Organs of immune system
- 1.2 Types of Immunity – Innate and acquired
- 1.3. Basic properties of antigens. Structure, function and types of an antibody.
- 1.4. B and T cell epitopes, haptens, adjuvants Antigen-antibody reactions,
- 1.5 T-Cell and B-Cell activation Monoclonal antibodies and their production

UNIT – II

- 2.1 Structure and functions of major histocompatibility complex.
- 2.2 Basic properties and functions of Cytokines, Interferons and complement proteins
- 2.3 Humoral and Cell mediated immunity.
- 2.4 Types of hyper sensitivity.
- 2.5 Concepts of autoimmunity and immunodeficiency. Introduction to Vaccines and types of Vaccines

UNIT – III

- 3.1. Concept and Scope of Animal Biotechnology.
- 3.2 Cloning vectors - Plasmids, Cosmids, Lambda bacteriophage, YAC,
- 3.3 Cloning- Cloning methods (Cell, Animal and Gene cloning)
- 3.4 Animal Cell culture - Equipment and materials for animal cell culture
- 3.5 Applications of cell culture techniques

UNIT – IV

- 4.1 Recombinant DNA technology and its applications
- 4.2 Transgenesis – Methods of Transgenesis.
- 4.3 Production of Transgenic animals
- 4.4 Application of Transgenic animals in Biotechnology.
- 4.5 Stem cells –types and their applications



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Suggested Readings;

Arthur C. Guyton MD, *A Text Book of Medical Physiology*, Eleventh ed., John E. Hall, Harcourt Asia Ltd.

William F. Ganong, *A Review of Medical Physiology*, 22 ed, McGraw Hill, 2005

Sherwood, Klandrof, Yanc, *Human Physiology*, Thompson Brooks/Coole, 2005.

Knut Schmidt-Nielson, *Animal Physiology*, 5th ed, Cambridge Low Price Edition.

Richard A. Glodsky, Thomas J Kind, Barbara A. Osborne, Janis Kuby,
Immunology, 5th ed, Freeman and Co. New York

Ivan Roitt, *Immunology*, 4th ed, Johanthan Brostoff, Mosby, London.

Thomas C. Chung, *General Parasitology*, Harcourt Brace and Co ltd. Asia. New Delhi.

Gerard D. Schmidt and Larry S Roberts, *Foundations of Parasitology*, McGraw Hill

Kindt, T. J., Goldsby, R. A., Osborne, B. A., Kuby, J. (2006). VI Edition.

Immunology. W.H. Freeman and Company.

Delves, P. J., Martin, S. J., Burton, D. R., Roitt, I.M. (2006). XI Edition. Roitt's
Essential Immunology, Blackwell Publishing.



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SEMESTER – VI

Immunology and Animal Biotechnology (Practical)

Max. Marks: 25

I. Immunology

1. Identification of Blood groups
2. Histological study of spleen, thymus and lymph nodes (through prepared slides)
3. Enumeration of RBC & WBC from a given blood sample
4. Enumeration of Differential count of WBC from a given blood sample
5. Demonstration of
 - a. ELISA , b. Immunoelectrophoresis
6. Identification of Autoimmune disease through charts.

II. Animal Biotechnology

1. Study the following techniques through photographs / virtual lab
 - a. Southern blotting
 - b. Western blotting
 - c. DNA sequencing (Sanger's method)
 - d. DNA finger printing
 - e. Identification of Vectors
 - f. Identification of Transgenic animals
2. PCR demonstration /virtual lab

- **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:

Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). Immunology, VI Edition. W.H. Freeman and Company.

David, M., Jonathan, B., David, R. B. and Ivan R. (2006). Immunology, VII Edition, Mosby, Elsevier Publication.

Abbas, K. Abul and Lechtman H. Andrew (2003.) Cellular and Molecular Immunology. V Edition. Saunders Publication.



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SEMESTER – VI

Elective Paper – VIII

A) Reproductive Biology (Theory)

Max. Marks: 60

Unit 1: Reproductive Endocrinology

Gonadal hormones and mechanism of hormone action, steroids, glycoprotein hormones, and prostaglandins, hypothalamo – hypophyseal – gonadal axis, regulation of gonadotrophin secretion in male and female; Reproductive System: Development and differentiation of gonads, genital ducts, external genitalia, mechanism of sex differentiation.

Unit 2: Functional anatomy of male reproduction

Outline and histological of male reproductive system in rat and human; Testis: Cellular functions, germ cell, system cell renewal; Spermatogenesis: kinetics and hormonal regulation; Androgen synthesis and metabolism; Epididymal function and sperm maturation; Accessory glands functions; Sperm transportation in male tract

Unit 3: Functional anatomy of female reproduction

Outline and histological of female reproductive system in rat and human; Ovary: folliculogenesis, ovulation, corpus luteum formation and regression; Steroidogenesis and secretion of ovarian hormones; Reproductive cycles (rat and human) and their regulation, changes in the female tract; Ovum transport in the fallopian tubes; Sperm transport in the female tract, fertilization; Hormonal control of implantation; Hormonal regulation of gestation, pregnancy diagnosis, foeto – maternal relationship; Mechanism of parturition and its hormonal regulation; Lactation and its regulation

Unit 4: Reproductive Health

Infertility in male and female: causes, diagnosis and management; Assisted Reproductive Technology: sex selection, sperm banks, frozen embryos, in vitro fertilization, ET, EFT, IUT, ZIFT, GIFT, ICSI, PROST; Modern contraceptive technologies; Demographic terminology used in family planning.



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SEMESTER – VI

Elective Paper – VIII

A) Reproductive Biology (Practical)

Max. Marks: 25

1. Study of animal house: set up and maintenance of animal house, breeding techniques, care of normal and experimental animals.
2. Examination of vaginal smear rats from live animals.
3. Surgical techniques: principles of surgery in endocrinology. Ovariectomy, hysterectomy, castration and vasectomy in rats.
4. Examination of histological sections from photomicrographs/ permanent slides of rat/human: testis, epididymis and accessory glands of male reproductive systems; Sections of ovary, fallopian tube, uterus (proliferative and secretory stages), cervix and vagina.
5. Human vaginal exfoliate cytology.
6. Sperm count and sperm motility in rat
7. Study of modern contraceptive devices

SUGGESTED READINGS

- Austin, C.R. and Short, R.V. reproduction in Mammals. Cambridge University Press.
- Degroot, L.J. and Jameson, J.L. (eds). Endocrinology. W.B. Saunders and Company.
- Knobil, E. et al. (eds). The Physiology of Reproduction. Raven Press Ltd.
- Hatcher, R.A. et al. The Essentials of Contraceptive Technology. Population Information Programme.



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Elective Paper – VIII

B) Aquatic Biology (Theory)

Max. Marks: 60

UNIT – I

- 1.1 Brief introduction of the aquatic biomes
- 1.2 Freshwater ecosystem (lakes, wetlands, streams and rivers), Estuaries, intertidal zones.
- 1.3 Oceanic pelagic zone, marine benthic zone.
- 1.4 Coral reefs

UNIT – II

- 2.1 Lakes Origin and classification of lakes, Lake as an Ecosystem, Lake morphometry,
- 2.2 Physico-chemical Characteristics of fresh water bodies: Light, Temperature, Thermal stratification, Dissolved Solids, Carbonate, Bicarbonates, Phosphates and Nitrates, Turbidity: dissolved gases (Oxygen, Carbon dioxide).
- 2.3 Nutrient Cycles and Lakes- Nitrogen, Sulphur and Phosphorous.
- 2.4 Streams: Different stages of stream development, Physico-chemical environment, adaptation of hill-stream fishes.

UNIT – III

- 3.1 Salinity and density of sea water,
- 3.2 Continental shelf,
- 3.3 Adaptation of deep sea organisms.
- 3.4. Sea weeds.

UNIT – IV

- 4.1 Aquatic pollution - Causes of pollution: Agricultural, Industrial, Sewage, Thermal and Oil spills,
- 4.2 Eutrophication
- 4.3 Management and conservation
- 4.4 Water pollution acts of India, Sewage treatment and water quality assessment - BOD and COD.



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Elective Paper – VIII

B) AQUATIC BIOLOGY (Practical)

Max.Marks:25

PRACTICAL

1. Study of the topography of a lake
2. Physico-Chemical and biological analysis of a lake
Physico-Chemical analysis of water - O₂, CO₂, BOD, COD
Biological– Zooplanktons – Identification and population density of Zooplanktons of a lake
3. Determination of - Turbidity / transparency, Dissolved Oxygen, Free Carbon dioxide, Alkalinity (carbonates & bicarbonates) in water collected from a nearby lake / water body.
4. Instruments used in limnology (sacchi disc, van dorn bottle, conductivity meter, Turbidity meter, PONAR grab sampler) and their significance.
5. A Project Report on a visit to a Sewage treatment plant / Marine bio-reserve/Fisheries Institutes.

Suggested Readings:

1. Ananthkrishnan : Bioresources Ecology 3rd Edition
2. Goldman – Limnology, 2nd Edition
3. Odum and Barrett – Fundamentals of Ecology, 5th Edition\
4. Pawlowski: Physicochemical Methods for water and Wastewater Treatment, 1st Edition
5. Wetzel: Limnology, 3rd edition
6. Trivedi and Goyal: Chemical and biological methods for water pollution studies
7. Welch: Limnology Vols.I-II



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Elective Paper – VIII

C) Sericulture (Theory)

Max.Marks:60

Unit-1: Silk industry and mulberry production

- 1.1 Historical account and types of silkworms
- 1.2 Sericulture as rural industry and employment generation
- 1.3 Morphology and anatomy of mulberry.
- 1.4 Mulberry plantation and package of practices.
- 1.5 Pest and diseases of mulberry.

Unit-2: Silkworm biology and silkworm seed production

- 2.1 External characters of silkworms
- 2.2 Anatomy of silkworm.
- 2.3 Establishment of modal grainage house and grainage equipments
- 2.4 Seed production process.
- 2.5 Egg preservation and hibernation schedules.

Unit-3: Silkworm cocoon production and crop production

- 3.1 Rearing requirements- rearing house, equipments and disinfection.
- 3.2 Rearing of silkworm - incubation, hatching, brushing and rearing methods (Chawkie and late age silkworm).
- 3.3 Mounting, spinning and harvesting of cocoons
- 3.4 Pests of silkworm
- 3.5 Diseases of silkworm.

Unit-4: Post cocoon production

- 4.1 Physical and commercial characteristics of cocoon.
- 4.2 Natural and synthetic fibres- types, identification and uses.
- 4.3 Cocoon handling- stifling, cooking and brushing.
- 4.4 Silk reeling process.
- 4.5 Raw silk testing and grading.



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Elective Paper – VIII

C) Sericulture (Practical)

Max.Marks:25

1. Morphology of mulberry plant with reference to various vegetative and floral parts.
2. Collection and identification of pests and disease of mulberry and control measures.
3. Anatomy of stem, root, leaf' petiole (section cuttings & preparation of permanent slides)
4. Anatomy of silkworm- digestive system, silk gland, respiratory system.
5. Mother moth Examination (Individual and mass mother moth examination)
6. Identification of Mulberry and non mulberry silkworm
7. Identification of rearing equipments, chawkie and late age worms.
8. Identification different diseases and pest of silkworm and control measures.
9. Determination of silk ratio percentage of cocoons
10. Identification test for natural and synthetic fibres.



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