

UNIT 7: Statistics

Concept of statistics, relevance in education, parametric and non-parametric data; graphical representation of data: histogram, frequency polygon, ogive and pie chart; Measures of Central Tendency: concept, computation and interpretation; measures of variability: concept, computation and interpretation; normal probability curve: concept, application and interpretation.

Correlation: concept, computation and interpretation- Product Moment, Rank Order, Biserial, Point Biserial, Phi, Contingency, Tetrachoric; significance of mean: concept, computation and interpretation of significance of t-test (correlated and uncorrelated, matched, paired-unpaired, matching- paired); ANOVA (One way) : concept, computation and interpretation, regression and prediction; chi square: concept, computation and interpretation (equal and normal probability).

UNIT 8: Research Report

Format of the research report Style of writing the report References and bibliography

Reference books:

1. Best John W. and James Kahn, V., 1989, Research in Education, Sixth Edition, Prentice-Hall of India Pvt.Ltd, New Delhi.
2. Sharma R.A., 1992, Fundamentals of Educational Research, Loyal Book Depot, Meerut, UP, India.
3. Kulbir Singh Sidhu, 1990, Methodology of Research in Education, Sterling Publishers Pvt. Ltd., New Delhi.
4. Lokesh Koul, 1997 Methodology of educational Research, third edition, Vikas Publishing House Pvt. Ltd. , New Delhi.
5. Kothari C.R., 1990, Research Methodology Methods and Techniques, Wiley Eastern Limited, New Delhi.
6. Borg Walter R., Gall Meridith D., 1983, Educational Research an Introduction, Fourth Edition, Longaman, New York & London.
7. Nitko Anthony J., 1983, Educational Tests and Measurement an Introduction, Harcourt
Brace Jovanovich, Inc., New York.
8. Aggarwal Y.P., 1988, Statistical Methods Sterling Publishers Pvt. Ltd., New Delhi.
9. Garret Hnery E., 1985 Statistics in Psychology and Education, Viakils, Feffer and Simon, Bombay.
10. Guilford, J.P., and Benjamin Fruchter, 1982 Fundamentals of statistics in Psychology and Education, Fifth edition, Mc Graw-Hill Book Company, New York.
11. Gupta S.C. and Kapoor V.K., 1999, Fundamentals of Mathematical Statistics, Sultan Chand & Sons Educational Publishers, New Delhi.
12. Grewal P.S., Methods of Statistics Analysis, Sterling Publishers Pvt. Ltd., New Delhi.
13. Bruce W. Tuckman, Statistics in Psychology and Education.

Part-B (Subject Wise)

Medical Biochemistry

Bio-Chemistry of Metabolism.

Vitamins, Hormones and Nutrition.

Genetics and Molecularbiology

BIO-CHEMISTRY OF METABOLISM:

Intermediary metabolism of carbohydrates, Lipids and Proteins and their Inter-relationships, Biological Oxidations, Metabolism of purines and pyrimidines, nucleic acids, Nucleoproteins, Mineral Metabolism. Inborn errors of metabolism.

VITAMINS, HORMONES AND NUTRITION:

Chemistry and Functions of Vitamins and Hormones; Bio-chemistry of blood clotting and respiration. Acid base balance, Muscle contraction. Minerals and their role in nutrition.

Nutrition in Health and Disease. Detoxication, Chemical structure and biological activity of antibiotics. Nitrogen fixation. Fermentation.

GENETICS AND MOLECULAR BIOLOGY:

1- The structure and Function of Proteins.

- I. Introduction.
- II. II. Classification of proteins.
- III. III. General structure of proteins.
 - (A) Amino acids.
 - (B) The peptide bond.
 - (C) Primary structure.
 - (D) Protein conformation.
 - (E) Quaternary structure.
 - (F) Isozymes.
 - (G) Multi-enzyme complexes.
- IV. General properties of proteins.
 - (A) Proteins and ampholytes.
 - (B) Molecular weights.
 - (C) Proteins as antigens.
- V. Effect of mutation.
 - (A) Protein structure.
 - (B) Protein properties.

2. Genes, Proteins and the Control of Gene Expression

- I. Introduction.
 - (A) Genotype and phenotype.
 - (B) The gene.
 - (C) Mutation.
 - (D) Complementation.
- II. Some established aspects of genetic regulation.
 - (A) The operon.
 - (B) Bacteriophage Lambda.
 - (C) Translational control in RNA bacteriophage.
 - (D) Autogenous regulation.

- III. Genetic regulation of Mammalian protein.
 - (A) Regulatory aspects of inborn errors.
 - (B) Expression of specialized proteins in differentiated cells.
 - (C) The induction of protein synthesis by hormones.
- IV. Genetic regulation and development.
 - (A) Hierarchies of control.
 - (B) Chromosomal proteins.
 - (C) Models of genetic regulation.
- V. Expression of the differentiated phenotype in vitro.
 - (A) Analysis of differentiation in culture tumour by cell fusion.
 - (B) Mechanism of extinction re-expression of luxury functions in hybrids.
 - (C) Analysis of malignancy.
 - (D) Teratomas.
- VI. Antibody biosynthesis and the generation of antibody diversity.
 - (A) Antibody biosynthesis.
 - (B) The problem of antibody diversity.
 - (C) VE markers in the rabbit and mouse.
 - (D) A gene stitching model.
 - (E) Somatic mutation.
- VII. Gene clusters in eukaryotes.
- VIII. Inserted sequences in structural genes.
- IX. Conclusion.

3. Chromosomes and Protein Variation.

- I. Introduction.
- II. The human chromosomes.
 - (A) Identification and linear differentiation.
 - (B) Variability.
 - (C) Variability and linear differentiation.
 - (D) Human BHA and the number of genes in man.
- III. Mapping.
- IV. Protein studies in chromosomal disorders.
 - (A) Studies of the products of localized.
 - (B) Further biochemical studies in autosoma anomalies.
 - (C) Discussion.
 - (D) Expression of gonosomal genes.
 - (E) Aneuploidy and the cell cycle.
- V. Nuclear organization.
- VI. New trends in the analysis of human genome.

4. Polymorphism, Selection and Evolution.

- I. Introduction.
- II. Selection
 - (A) Theoretical considerations.
 - (B) Selection in human populations.
- III. Evolution.
 - (A) Gene flow and anthropology.
 - (B) General considerations and conclusions.

5. Enzyme Polymorphism.

- I. Introduction.
- II. Polymorphic enzyme systems.

- III. An attempt at a syntheses.
- 6. Inherited variation in Plasma Proteins.
 - I. Introduction and scope of chapter.
 - II. Techniques for recognizing inherited variation in proteins.
 - (A) Gel electrophoresis.
 - (B) Immunological techniques.
 - III. Polymorphism.
 - (A) Established and high probable polymorphisms.
 - (B) Some possible polymorphisms.
 - IV. Rare Variations.
 - V. Comparative summary of polymorphisms prospects for further investigation.
- 7. In born Errors of metabolism.
 - I. Introduction.
 - II. Molecular concepts.
 - (A) Structural and control genes.
 - (B) Dominance and recessiveness.
 - III. Experimental approach.
 - (A) General considerations.
 - (B) Indirect approach.
 - (C) Direct approach.
 - IV. Tissue distribution.
 - V. Heterogeneity.
 - (A) Non allergic genes.
 - (B) Allergic genes.
 - VI. Heterozygote detection.
 - (A) Autosomal recessive transmission.
 - (B) X-linked recessive transmission
 - VII. Prenatal detection.
 - (A) Techniques.
 - (B) Results.
 - (C) Future prospects.
 - VIII. Classification of inborn errors of metabolism.
- 8. The Immunoglobulinopathies.
 - I. Introduction.
 - II. The immunoglobulins.
 - (A) General introduction
 - (B) Immunoglobulin genetic markers (Allotypes) in man.
 - (C) The immunogenetics basis for antibody diversity.
 - (D) Genetics of the immune response.
 - (E) Biosynthesis and metabolism of immunoglobulins.
 - (F) Development of immunoglobulins before and after parturition.
 - III. The immunoglobulinopathies.
 - (A) Classification and definition of terms.
 - (B) Hyperimmunoglobulinaemia.
 - (C) The paraimmunoglobulinopathies.
 - (D) Hypoimmunoglobulinopathies.