



CENTRE FOR DISTANCE AND ONLINE EDUCATION

MASTER OF LIBRARY AND INFORMATION SCIENCE

Knowledge Organization

MLIS-102



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Course Name: Knowledge Organization

Course Code: MLIS-102

Credits: 4

Course Objective:

To develop an understanding of the concepts of library classification, classification theories and their implication for the development of library classification systems.

Course Outcomes (COs):

S.No.	Course Outcomes (COs)
1.	Understand the general theory of classification and Universe of Knowledge.
2.	Understand the modes of formation of subjects and methods for revision of major Classification Schemes.
3.	Grasp an understanding of special classification schemes.
4.	Understand the contributions of significant people in the field of cataloguing.
5.	Know the Web based cataloguing systems.
6.	Understand subject cataloguing with the help of PRECIS, POPSI and Chain Indexing.

BLOCK I Classification Contributions and Universe of Knowledge

Unit -1 General theory of Classification: Contributions of Richardson, W.C. Berwick Sayers, H.E. Bliss,

Unit - 2 Universe of Knowledge: Mapping and Problems

Unit - 3 Contribution of S.R. Ranganathan and CRG

BLOCK II Formation of Subjects, Features of Classification Schemes & Notations

Unit - 4 Modes of formation of Subjects and Methods of Scholarship vis-à-vis revision of CC, UDC and DDC

Unit - 5 Features of Special Classification Schemes

Unit - 6 Notation: Definition, Kinds and Function

BLOCK - III Contributions, Resource Description and Access and Online Cataloguing

Unit - 7 Contributions of Cutter, Lubetzky, Ranganathan in the field of Cataloguing.

Unit - 8 Resource Description and Access (RDA) : Concept and Structure.

Unit - 9 Online Cataloging: OPACs and Web OPAC with examples at national and

international level.

BLOCK – IV Subject Cataloguing & Subject Headings

Unit - 10 Subject Cataloguing: Definition and General Principles

Unit - 11 Choice and Rendering of Subject Headings: LCSH, POPSI, PRECIS

Unit - 12 Thesaurus: Need and Guiding Principles for Compilation

BLOCK -V Union Catalogue, Indexing & Abstracting

Unit - 13 Layout and rules for the Union Catalogues of Books, Periodicals

Unit - 14 Indexing and Abstracting Journals

Unit – 15 National Bibliographies.

Unit - 16 Compilation of Local, National and International Union Catalogues, Application of IT

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**CENTRE FOR DISTANCE
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**MASTER OF LIBRARY
AND
INFORMATION SCIENCE**

**Research Methodology
&
Statistical Techniques**

MLIS-103



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Course Name: Research Methodology & Statistical Techniques

Course Code: MLIS-103

Credits: 4

Course Objective:

To understand the concept of Research Design, Tools and Techniques for carrying out the research in various fields of Library and Information Science.

Course Outcomes (COs):

S. No.	Course Outcomes (COs)
1.	Understand the concept of research design, tools and techniques
2.	Understand the designing of a Research Proposal
3.	Develop a thorough understanding of research data analysis, interpretation and presentation
4.	Use different statistical techniques and statistical packages
5.	Develop skills for writing and evaluating a research report
6.	Develop skills for Research Ethics & Plagiarism

BLOCK-I Introduction of Research

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Unit - 2 Identification, Formulation of Problems

Unit - 3 Hypothesis: Definition, Types, Need and Purpose

BLOCK- II Research Design, Methods and Techniques

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Unit - 5 Scientific Method of Research; Ranganathan's Spiral of Scientific Method

Unit - 6 Research Methods: Historical, Descriptive, Case Study, Exploratory

Unit - 7 Research Techniques and Tools: Questionnaire, Interview, Observation Methods

BLOCK -III Statistical Techniques

Unit - 8 Presentation of Data: Tabular, Graphic, Bar Diagram and Pie Chart etc.

Unit - 9 Sampling Techniques: Procedure, Types

Unit - 10 Descriptive Statistics: Measures of Central Tendency (Mean, Mode, Median)

Unit - 11 Measures of Dispersion: Variance and Standard Deviation

BLOCK-IV Statistical Inference, Bibliometrics and Report Writing

Unit - 12 Regression Analysis, Testing of Hypothesis: Chi-Square Test, f-test, t-test, z-test

Unit – 13 Bibliometrics: Concept, Need, Laws of Bibliometrics and their Applications

Unit - 14 Citation Analysis, Content Analysis

Unit - 15 Statistical packages – SPSS, (introduction)

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MASTER OF SCIENCE
(CHEMISTRY)

CHL-6111

Instrumental Chemistry of Analysis

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Course Name: Instrumental Chemistry of Analysis

Course Code: CHL-6111

Credits: 4

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Learn Today to **Lead Tomorrow**

Course Name: Transition and Inner Transition Metal Chemistry

Course Code: CHL-6213

Credits: 4

BLOCK I: COORDINATION CHEMISTRY: GENERAL INTRODUCTION

UNIT 1:

- 1.0 Objectives
- 1.1 Introduction
 - 1.1.1 Important terms used in co-ordination chemistry
 - 1.1.2 Nomenclature of coordination compounds
 - 1.1.3 ligands and its Types of Ligands
- 1.2 Isomerism in coordination compounds
- 1.3. Theories of coordination compounds
 - 1.3.1 Werner's theory of coordination complexes
 - 13.2. Valence bond theory (VBT)
 - 13.2.1 Limitations of VBT
 - 13.3 Crystal Field Theory (CFT)
 - 13.3.1 Crystal field splitting
 - 13.3.1.2 splitting of d orbitals
 - 13.3.2 Factors affecting $10Dq$
 - 13.3.3 Crystal field stabilization energy (CFSE)
 - 13.3.4 High and Low spin complexes
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 - 13.3.5 CFT in tetragonal and square planar complexes
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- 13.5 Keywords
- 13.6 review Questions
- 13.7 Further Readings

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 - 2.5.2 π -Bonding in Octahedral Complexes
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- 2.8 Keywords
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 - 3.2.2 Paramagnetism
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- 3.5 Spin Crossover
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- 5.2.7 IR spectroscopy
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- 15.11 Further Readings

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Classification**

BLO-1102



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Course Name: Knowledge Organization Classification (Theory)

Course Code: BLO-1102

Credits: 4

Course Objective: To develop an understanding of the concepts, theories and importance of library classification, and its use in the organization of knowledge in libraries.

Course Outcomes (COs):

S. No.	Course Outcomes (COs)
1.	Understand the meaning, purpose, functions, theories and canons of library classification
2.	Analyze the characteristics, merits and demerits of different species of library classification schemes
3.	Highlight salient features of major classification schemes
4.	Elucidate various facets of notation and call number
5.	Review current trends in library classification

Block I: Library Classification

Unit 1: Classification: Definition, Need, Purpose

Unit 2: Terminology of Classification

Unit 3: General Theory of Classification

Unit 4: Species of Classification

Block II: Major Classification

Unit 5: Major Schemes of Classification: An Overview

Unit 6: DDC,

Unit 7: CC,

Unit 8: UDC,

Block III: Normative Principles of Classification

Unit 9: Work of Classification in three Planes: Canons and their applications in Standard Schemes

Unit 10: Fundamental Categories

Unit 11: Phase Relation and Common Isolates

Block IV: Mnemonics

Unit 12: Definition, types, Canons and their applications in Standard Schemes

Unit 13: Hospitality in Notational System: Canons and Devices

Unit 14: Notation: Need, Purpose, Types and Qualities

Unit 15: Mechanics

Block V: Facet Sequence

Unit 16: Concept and Principles

Unit 17: Postulation Steps in Practical Classification

Unit 18: Book Number and Collection Number

Unit 19: Library Classification and Trends

Text and Reference Books

1. Hunter, Eric J. Classification made Simple, Taylor and Francis, 2002
2. Krishan Kumar. Theory of classification, Vikas, New Delhi, 1993
3. Shabhahat, Husain. Library Classification: Facets and Analysis, 2nd rev ed., B.R. Publications, Delhi, 2002.

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Block-I: Library Classification

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- 1.2 Classification
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- 1.7 Keywords
- 1.8 Review Questions
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- 2.4 Keywords
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Unit 3:

- 3.0 Objectives
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- 3.2 General Theory of Classification
- 3.3 Summary
- 3.4 Keywords
- 3.5 Review Questions
- 3.6 Further Readings

Unit 4:

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Block -III Normative Principles of Classification

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Unit 11:

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Information Centers

BLO-1201



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Course Name: Management of Libraries and Information Centers

Course Code: BLO-1201

Credits: 4

Course Objective:

To equip students with an understanding of the concept and principles of library management and its application in the organization and management of building, operations, services and human resource of the library.

Course Outcomes (COs):

S. No.	Course Outcomes (COs)
1.	Understand the concept and scope of library management
2.	Elaborate principles and functions of library management
3.	Efficiently carry out various operations of Library and Information Centers
4.	Comprehend the concept of Financial Management and Human Resource Management
5.	Designing of library and information system/ MIS
6.	Maintain the library statistics and prepare annual report

Block I: Essentials of Management

Unit 1: Concept, history and functions of Management

Unit 2: Principles of Management & their application in Libraries and Information Centers

Unit 3: Elements of Management Process: POSDCORB

Unit 4: Concept, Policy, Elements and Principles and TQM

Block II: Library Management-General aspects

Unit 5: HRM

Unit 6: Job Description: Analysis, Specification and Evaluation, Selection and Recruitment

Unit 7: Motivation

Unit 8: Training and Development, Performance Appraisal

Unit 9: Sources of Library Finance

Block III: Library Management-General aspects

Unit 10: Library Authority and Library Committee

Unit 11: Staffing, Different Sections of Libraries and their working

Unit 12: Selection – tools for book and non-book materials

Unit 13: Handling of Government Documents and Manuscripts

Block IV: Collection Development and Management

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Unit 17: Stock Verification

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Unit 15: System analysis, Design of Library system

- 15.1 Objectives
- 15.2 Introduction
- 15.3 System Analysis
- 15.4 Design of Library System
- 15.5 Summary
- 15.6 Keywords
- 15.7 Review Questions
- 15.8 Further Readings

Unit 16: Preservation and Conservation of Library Resources (printed and digital)

- 16.1 Objectives
- 16.2 Introduction
- 16.3 Preservation and Conservation of Library Resources
- 16.4 Summary
- 16.5 Keywords
- 16.6 Review Questions
- 16.7 Further Readings

Unit 17: Stock Verification

- 17.1 Objectives
- 17.2 Introduction
- 17.3 Stock Verification
- 17.4 Summary
- 17.5 Keywords
- 17.6 Review Questions
- 17.7 Further Readings

Block V: Financial Management and Annual Report

Unit 18: Financial Management in Libraries, Budget Estimation – Line Budget, Program Budget, Performance Budget

- 18.1 Objectives
- 18.2 Introduction
- 18.3 Financial Management in Libraries
- 18.4 Budget Estimation
 - 18.4.1 Line Budget,
 - 18.4.2 Program Budget,
 - 18.4.3 Performance Budget
- 18.5 Summary
- 18.6 Keywords
- 18.7 Review Questions
- 18.8 Further Readings

Unit 19: Organizational Structure: Centralized and Decentralized

- 19.1 Objectives
- 19.2 Introduction
- 19.3 Organizational Structure: Centralized
- 19.4 Organizational Structure: Decentralized
- 19.5 Summary
- 19.6 Keywords
- 19.7 Review Questions
- 19.8 Further Readings

Unit 20: Library Statistics, Annual Report: Compilation, Contents and Style

- 20.1 Objectives
- 20.2 Introduction
- 20.3 Library Statistics,
- 20.4 Annual Report: Compilation, Contents and Style
- 20.5 Summary
- 20.6 Keywords
- 20.7 Review Questions
- 20.8 Further Readings



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MASTER OF SCIENCE (Physics)

PHO-6111

Mathematical Physics-I

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Course Code: PHO-6111

Course: Mathematical Physics-I

Credit: 4

Block – 1: Theory of Functions of a Complex Variable

Unit-1: Cauchy-Reimann Equation

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Analyticity and Cauchy-Reimann Conditions,
- 1.3 Cauchy's integral theorem and formula
- 1.4 Summary
- 1.5 Keywords
- 1.6 Review questions
- 1.7 Further readings

Unit-2: Taylor' Series and Laurent's series expansion

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Taylor's series and Laurent's series expansion
- 2.3 Zeros and singular points points
- 2.4 Multivalued functions
- 2.5 Branch Points and Cuts
- 2.6 Summary
- 2.7 Keywords
- 2.8 Review questions
- 2.9 Further readings

Unit-3: Residues and Cauchy's Residue theorem

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Riemann Sheets and surfaces
- 3.3 Residues
- 3.4 Cauchy's Residue theorem
- 3.5 Jordan's Lemma
- 3.6 Summary
- 3.7 Keywords
- 3.8 Review questions
- 3.9 Further readings

Unit-4: Definite Integrals

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Evaluation of definite integrals
- 4.3 Principal Value
- 4.4 Bromwich contour integrals
- 4.5 Summary
- 4.6 Keywords
- 4.7 Review questions
- 4.8 Further readings

Block – 2: Fourier Transform

Unit-5: Fourier Transform and Dirac Delta Function

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Fourier transform
- 5.3 Sine, Cosine and Complex transforms with examples
- 5.4 Definition
- 5.5 Properties and Representations of Dirac Delta Function
- 5.6 Summary
- 5.7 Keywords
- 5.8 Review questions
- 5.9 Further readings

Unit-6: Properties of Fourier Transforms

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Properties of Fourier transform
- 6.3 Transforms of derivatives
- 6.4 Summary
- 6.5 Keywords
- 6.6 Review questions
- 6.7 Further readings

Unit-7: Parseval's Theorem and Convolution Theorem

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Parseval's Theorem
- 7.3 Convolution Theorem
- 7.4 Momentum representation
- 7.5 Applications to Partial differential equations

- 7.4 Summary
- 7.5 Keywords
- 7.6 Review questions
- 7.7 Further readings

Unit-8: Discrete Fourier transform

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Discrete Fourier transform
- 8.3 Introduction to Fast Fourier transform
- 8.4 Summary
- 8.5 Keywords
- 8.6 Review questions
- 8.7 Further readings

Block – 3: Laplace Transforms

Unit-9: Laplace Transforms

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Laplace Transforms
- 9.3 Summary
- 9.4 Keywords
- 9.5 Review questions
- 9.6 Further readings

Unit-10: Properties and examples of Laplace Transform

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Properties and examples of Laplace Transform
- 10.3 Summary
- 10.4 Keywords
- 10.5 Review questions
- 10.6 Further readings

Unit-11: Convolution theorem and its applications

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Convolution theorem and its applications
- 11.3 Summary
- 11.4 Keywords
- 11.5 Review questions
- 11.6 Further readings

Unit-12: Laplace transform method of solving differential equations

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Laplace transform method of solving differential equations
- 12.3 Summary
- 12.4 Keywords
- 12.5 Review questions
- 12.6 Further readings

Block – 4: Group Theory

Unit-13: Concept of a group

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Concept of a group (additive and multiplicative, isomorphism and homomorphism)
- 13.3 Summary
- 13.4 Keywords
- 13.5 Review questions
- 13.6 Further readings

Unit-14: Matrix representation

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Matrix representation of a group
- 14.3 Reducible and irreducible representation of a group
- 14.4 Summary
- 14.5 Keywords
- 14.6 Review questions
- 14.7 Further readings

Unit-15: The Great Orthogonality Theorem

- 15.0 Objectives
- 15.1 Introduction
- 15.2 The Great Orthogonality Theorem (without proof)
- 15.3 Continuous
- 15.4 Summary
- 15.5 Keywords
- 15.6 Review questions

- 15.7 Further readings

Unit-16: Lie groups

- 15.0 Objectives

15.1 Introduction

15.2 Lie Groups

15.3 Summary

15.4 Keywords

15.5 Review questions

15.6 Further readings

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MASTER OF SCIENCE (Physics)

PHO-6112

Classical Mechanics

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Course Code: PHO-6112

Course: Classical Mechanics

Credit: 4

Block – 1: Classical Mechanics Fundamentals and Principles

Unit-1: Newtonian physics

- 1.0 Objectives
- 1.1 Introduction
- 1.2 General idea of Newtonian physics
- 1.3 Mechanics of a particle
- 1.4 Mechanics of a system of particles
- 1.5 Summary
- 1.6 Keywords
- 1.7 Review questions
- 1.8 Further readings

Unit-2: D'Alembert's principle

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Constraints
- 2.3 Generalized coordinates
- 2.4 D'Alembert's principle and Lagrange's equations
- 2.5 Summary
- 2.6 Keywords
- 2.7 Review questions
- 2.8 Further readings

Unit-3: Hamilton's principle

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Hamilton's principle
- 3.3 Derivation of Lagrange's equations from Hamilton's principle
- 3.4 Extension of Hamilton's principle to non-holonomic system
- 3.5 Summary
- 3.6 Keywords
- 3.7 Review questions
- 3.8 Further readings

Unit-4: Generalized momenta

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Conservation theorems and symmetry properties
- 4.3 Generalized momenta
- 4.4 Cyclic co-ordinates
- 4.5 Summary
- 4.6 Keywords
- 4.7 Review questions
- 4.8 Further readings

Block – 2: Canonical Transformations and Hamilton-Jacobi Method

Unit-5: Canonical transformation

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Equation of canonical transformation,
- 5.3 examples of canonical transformation
- 5.4 Summary
- 5.5 Keywords
- 5.6 Review questions
- 5.7 Further readings

Unit-6: Poisson and Lagrange brackets

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Poisson and Lagrange brackets and their invariance under canonical transformation
- 6.3 Jacobi's Identity
- 6.4 Poisson's Theorem
- 6.5 Summary
- 6.6 Keywords
- 6.7 Review questions
- 6.8 Further readings

Unit-7: Equations of motion in infinitesimal canonical transformation

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Equations of motion in infinitesimal canonical transformation in the poisson bracket formulation

- 7.3 Summary
- 7.4 Keywords
- 7.5 Review questions
- 7.6 Further readings

Unit-8: Hamilton Jacobi Method

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Hamilton Jacobi Method
- 8.3 Generating functions
- 8.4 Summary
- 8.5 Keywords
- 8.6 Review questions
- 8.7 Further readings

Block – 3: Celestial Mechanics and Small Oscillations

Unit-9: Two body central force problem

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Two body central force problem
- 9.3 Bound state
- 9.4 Reduction of two-body problem to one body problem
- 9.5 Summary
- 9.6 Keywords
- 9.7 Review questions
- 9.8 Further readings

Unit-10: Motion in a central force field

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Motion in a central force field
- 10.3 The virial theorem
- 10.4 The inverse square law of force
- 10.5 Summary
- 10.6 Keywords
- 10.7 Review questions
- 10.8 Further readings

Unit-11: Kepler problem

- 11.0 Objectives
- 11.1 Introduction
- 11.2 The motion in central force in the Kepler problem
- 11.3 Summary
- 11.4 Keywords
- 11.5 Review questions
- 11.6 Further readings

Unit-12: Small oscillations

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Concept of small oscillations
- 12.3 Eigen value equation
- 12.4 simple application
- 12.5 Normal coordinates and modes
- 12.6 Summary
- 12.7 Keywords
- 12.8 Review questions
- 12.9 Further readings

Block – 4: Relativistic mechanics

Unit-13: Lorentz transformations

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Four dimensional representation of the Lorentz transformations
- 13.3 Covariance of the laws of nature
- 13.4 Summary
- 13.5 Keywords
- 13.6 Review questions
- 13.7 Further readings

Unit-14: Four vectors

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Four vectors
- 14.3 Velocity momentum
- 14.4 Force and their transformation
- 14.5 Summary
- 14.6 Keywords

14.7 Review questions

14.8 Further readings

Unit-15: Equation of motion in four vector form

15.0 Objectives

15.1 Introduction

15.2 Equation of motion of a point particle in four vector form

15.3 Summary

15.4 Keywords

15.5 Review questions

15.6 Further readings

Unit-16: Relativistic Lagrangian and Hamiltonian

16.0 Objectives

16.1 Introduction

16.2 Relativistic Lagrangian and Hamiltonian of a charged particle in an em field

16.3 Summary

16.4 Keywords

16.5 Review questions

16.6 Further readings

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BACHELOR OF JOURNALISM
AND
MASS COMMUNICATION

History of Mass Media

JMO- 1102



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COURSE NAME: History of Mass Media

COURSE CODE: JMO 1102

Block 1

UNIT 1: INVENTION OF PRINTING PRESS

Page No. 02 – 11

- 1.0- Objectives
- 1.1- Introduction
- 1.2- Invention of Paper
- 1.3- Invention of Printing Press
 - 1.3.1- Gutenberg's Work
 - 1.3.2- Gutenberg's Life
 - 1.3.3- Why is a printing press vital to us?
- 1.4- Development of Printing
 - 1.4.1- Printing press arrival in India
 - 1.4.2- First published books in India
 - 1.4.3- Indian script printing
- 1.5- Early efforts to publish newspapers in India
- 1.6- Let Us Sum Up
- 1.7- Questions
- 1.8- Suggesting Readings

UNIT 2: INDEPENDENCE AND THE PRESS

Page No. 12-29

- 2.0- Objectives
- 2.1- Introduction
- 2.2- Independence and the Press
- 2.3- Issues of Freedom
- 2.4- Political and Press Freedom
 - 2.4.1- Political Freedom
 - 2.4.2- Political Freedom Importance
 - 2.4.3- Press Freedom
 - 2.4.4- Press Freedom Importance
 - 2.4.5- Relationship between press freedom and politics
- 2.5- Birth of the Indian Language Press
 - 2.5.1- Hindusthan Samachar
 - 2.5.2- Samachar Bharati
 - 2.5.3- The Major Indian Language Newspaper
 - 2.5.4- Differences between English Newspapers and Language News Papers
 - 2.5.5- Reasons for Newspaper Boom
 - 2.5.6- Future of the Language Press in India
- 2.6- Contribution of Raja Ram Mohan Roy
 - 2.6.1- Born, Family and Education of Raja Ram Mohan Roy
 - 2.6.2- Raja Ram Mohan Roy Works for Society
 - 2.6.3- Raja Ram Mohan Roy Religious Writings
 - 2.6.4- Sambad Kaumudi
 - 2.6.5- Mirat-ul-Akbar
 - 2.6.6- Atmiya Sabha
 - 2.6.7- Brahma Sabha

- 2.6.8- Sati Pratha
- 2.7- Let Us Sum Up
- 2.8- Questions
- 2.9- Suggesting Readings

UNIT 3: BIRTH OF THE INDIAN NEWS AGENCIES AND WESTERN NEWS AGENCIES

Page No. 30-39

-
- 3.0- Objectives
 - 3.1- Introduction
 - 3.2- Birth of the Indian News Agencies and Western News Agencies
 - 3.2.1 News Agencies in India
 - 3.2.2- Press Trust of India
 - 3.2.3- Asian News International
 - 3.2.4- International News Agencies
 - 3.2.5- Agence France-Presse
 - 3.2.6- Xinhua News Agency
 - 3.2.7- Reuters
 - 3.3- The Indian Press and Freedom Movement
 - 3.3.1- Four Movement for Freedom in India
 - 3.3.2- Role of Indian Press to help Indian Freedom movement
 - 3.4- Mahatma Gandhi and His Journalism
 - 3.4.1- Launch of 'Indian Opinion'
 - 3.4.2- Satyagraha and Journalism
 - 3.4.3- 'Young India' and 'Harijan'
 - 3.4.4- Impact and Legacy
 - 3.5- Let Us Sum Up
 - 3.6- Questions
 - 3.7- Suggesting Readings

UNIT 4: SOCIAL, POLITICAL AND ECONOMIC ISSUES BEFORE AND AFTER INDEPENDENCE

Page No. 40-51

-
- 4.0- Objectives
 - 4.1- Introduction
 - 4.2- Social, Political and Economic Issues before Independence and the Indian Press
 - 4.2.1- Child Marriage
 - 4.2.2- Gender Discrimination
 - 4.2.3- Illiteracy
 - 4.2.4- Caste System
 - 4.2.5- Colonialism and Imperialism
 - 4.2.6- Nationalism and Identity
 - 4.2.7- Social Injustices
 - 4.2.8- Economic Exploitation
 - 4.2.9- Political Representation and Autonomy
 - 4.2.10- Suppression of Dissent
 - 4.2.11- Economic Issues
 - 4.2.12- Global Solidarity
 - 4.2.13- Emergence of Economic Thinkers
 - 4.2.14- Striving for Self-Sufficiency

- 4.2.15- Formation of Economic Organizations
- 4.2.16- Movements for Economic Justice
- 4.2.17- Building Economic Awareness
- 4.2.18- Seeds of Economic Planning
- 4.2.19- Lack of Access to Education and Skills
- 4.2.20- Suppression of Indigenous Industries
- 4.2.21- Trade Imbalances
- 4.2.22- Infrastructure Deficiencies
- 4.2.23-Exploitative Colonial Policies
- 4.2.24-Limited Industrialization
- 4.2.25-Agriculture and Land Issues
- 4.3- The press in India after Independence
- 4.3.1- Freedom of the Press
- 4.3.2- Role in Democracy
- 4.3.3- Challenges and Concerns
- 4.3.4- Social Issues
- 4.3.5- Political Influence
- 4.3.6- Global Reach
- 4.3.7- Media Ethics
- 4.4- Let Us Sum Up
- 4.5- Questions
- 4.6- Suggesting Readings

**UNIT 5: SOCIAL, POLITICAL AND ECONOMIC ISSUES AND THE ROLE OF
THE INDIAN PRESS**

Page No. 52-63

- 5.0- Objectives
- 5.1- Introduction
- 5.2- Social, political and economic issues and the role of the Indian press
- 5.2.1- Social issues and the role of the Indian press
- 5.2.2- Gender Inequality
- 5.2.3- Environmental Issues
- 5.2.4- Healthcare and Public Health
- 5.2.5- Human Rights
- 5.2.6- Social Movements
- 5.2.7-The Pre-Independence Political Landscape
- 5.2.8-The establishment of British colonial rule in India
- 5.2.9-The revolt of 1857 and its significance
- 5.2.10-Moderates
- 5.2.11-Extremists
- 5.2.12-The Division between Moderates and Extremists
- 5.2.13-Formation of Indian National Congress (INC) and its Objectives
- 5.2.14-Indian Press and its Role
- 5.2.15-Role in National Awakening
- 5.2.16- Economic Issues in Pre-Independence India
- 5.2.17- Drain of wealth
- 5.2.18- Skewed Trade Policies
- 5.2.19- Inadequacy of Infrastructure
- 5.2.20- Economic Disparities
- 5.2.21- Heavy Taxation

- 5.3- Let Us Sum Up
- 5.4- Questions
- 5.5- Suggesting Readings

BLOCK 2

UNIT 6: DEVELOPMENT OF RADIO AS A MEDIUM OF MASS COMMUNICATION

Page No. 64-77

-
- 6.0- Objectives
 - 6.1- Introduction
 - 6.2- Development of Radio as a medium of Mass Communication
 - 6.2.1- Radio Programs Contribute To Preserving & Promoting Indian Culture
 - 6.2.2- News Services
 - 6.2.3- Educational Radio
 - 6.2.4- Special Audience Programmes
 - 6.2.5- Vividh Bharati
 - 6.2.6- Importance
 - 6.2.7- Advantages
 - 6.3- Let Us Sum Up
 - 6.4- Questions
 - 6.5- Suggesting Readings

UNIT 7: HISTORY OF RADIO IN INDIA

Page No. 78-89

-
- 7.0- Objectives
 - 7.1- Introduction
 - 7.2- History of Radio in India
 - 7.2.1- AIR
 - 7.2.2- News Services
 - 7.3- Radio as an instrument of propaganda during the World War II
 - 7.3.1- Advantages of State-Controlled Broadcasting
 - 7.3.2- Disadvantages of State-Controlled Broadcasting
 - 7.3.3- Nazi Germany's Propaganda Machine
 - 7.3.4- Allied Counter-Propaganda
 - 7.3.5- Radio's Impact on the Home Front
 - 7.3.6- Dissemination of War-Related Information
 - 7.3.7- Psychological Warfare
 - 7.3.8- Use of Radio in Occupied Territories
 - 7.3.9- Impact of Radio on Post-War Society
 - 7.3.10- Impact of Radio on Post-War Society
 - 7.4- Let Us Sum Up
 - 7.5- Questions
 - 7.6- Suggesting Readings

UNIT 8: EMERGENCE OF AIR – COMMERCIAL BROADCASTING

Page No. 90- 102

-
- 8.0- Objectives
 - 8.1- Introduction
 - 8.2- Emergence of AIR – commercial broadcasting
 - 8.2.1- The Policy Change

- 8.2.2- Evolution into Commercial Broadcasting
- 8.2.3- Growth and Expansion
- 8.2.4- Regulatory Changes and Further Expansion
- 8.2.5- Early Beginnings
- 8.2.6- Expansion and Reach
- 8.2.7- Program Diversity
- 8.3- Let Us Sum Up
- 8.4- Questions
- 8.5- Suggesting Readings

BLOCK 3

UNIT 9: DEVELOPMENT OF TELEVISION AS A MEDIUM OF MASS COMMUNICATION

Page No. 103- 114

-
- 9.0- Objectives
 - 9.1- Introduction
 - 9.2- Development of television as a medium of mass communication
 - 9.3- Characteristics of Television as a Medium
 - 9.3.1- Audio-Visual Medium
 - 9.3.2- Domestic Medium
 - 9.3.3- Live Medium
 - 9.3.4- Transitory Medium
 - 9.3.5- Expensive Medium
 - 9.4- Functions of Television
 - 9.5- Effects of Television
 - 9.6- Future of Television
 - 9.7- Limitations of Television
 - 9.8- Let Us Sum Up
 - 9.9- Questions
 - 9.10- Suggesting Readings

UNIT 10: HISTORICAL PERSPECTIVE OF TELEVISION IN INDIA

PAGE No. 115-126

-
- 10.0- Objectives
 - 10.1- Introduction
 - 10.2- History of Television
 - 10.2.1- International Perspective
 - 10.2.2- Initial Development
 - 10.2.3- Public Broadcasting
 - 10.2.4- International Growth
 - 10.2.5- National Perspective
 - 10.2.6- Television in India
 - 10.3- Television for Development
 - 10.4- Television after Gulf War
 - 10.5- Let Us Sum Up
 - 10.6- Questions
 - 10.7- Suggesting Readings

- 11.0- Objectives
- 11.1- Introduction
- 11.2- Satellite and cable television in India
 - 11.2.1 Historical Perspective
 - 11.2.2- Proliferation and Growth
 - 11.2.3- Diverse Content
 - 11.2.4- Cultural Preservation and Promotion
 - 11.2.5- Satellite and cable television in India
 - 11.2.6- Challenges
 - 11.2.7- Global Impact
 - 11.2.8- Future Prospects
- 11.3- The evolution of Satellite television
- 11.4- The evolution of Cable television
- 11.5- Let Us Sum Up
- 11.6- Questions
- 11.7- Suggesting Readings

BLOCK 4

- 12.0- Objectives
- 12.1- Introduction
- 12.2- Early efforts – film as a mass medium
- 12.3- Invention of the Motion Picture Camera
- 12.4- Silent Era and Narrative Experimentation
- 12.5- Rise of Film Studios
- 12.6- Development of Genres
- 12.7- International Expansion
- 12.8- The Advent of Sound
- 12.9- Cultural Impact
- 12.10- Let Us Sum Up
- 12.11- Questions
- 12.12- Suggesting Readings

- 13.0- Objectives
- 13.1- Introduction
- 13.2- Historical Development of Indian films
 - 13.2.1- The Era of Silent Films
 - 13.2.2- Pre-Independence Talkies
 - 13.2.3- Post-Independence Cinema
- 13.3- Indian Cinemas as an Industry
- 13.4- Image of Hero

- 13.5- Image of Women
- 13.6- Music in Indian Cinema
- 13.7- Let Us Sum Up
- 13.8- Questions
- 13.9- Suggesting Readings

UNIT 14: INDIAN CINEMA AFTER INDEPENDENCE

Page No. 170- 183

- 14.0- Objectives
- 14.1- Introduction
- 14.2- Indian Cinema after Independence
 - 14.2.1- New Wave Cinema and Parallel Cinema Movement
 - 14.2.2- Mainstream Bollywood Success
 - 14.2.3- Regional Cinema Renaissance
 - 14.2.4- Global Recognition and Impact
 - 14.2.5- Diversification of Themes and Genres
 - 14.2.6- Technological Advancements
 - 14.2.7- Evolution of Social Realism
 - 14.2.8- Cultural Impact and Identity Formation
 - 14.2.9- Challenges and Criticisms
- 14.3- Let Us Sum Up
- 14.4- Questions
- 14.5 Suggesting Readings

UNIT 15: PARALLEL CINEMA

Page No.184- 193

- 15.0- Objectives
- 15.1- Introduction
- 15.2-Parallel Cinema
 - 15.2.1 Hindi Cinema of the 1970s
 - 15.2.3 Decline of Parallel Cinema
 - 15.2.4 Parallel Cinema - Legacy
- 15.3 Characteristics of Parallel cinema
- 15.4 Pros and Cons of Parallel Cinema
- 15.5 Let Us Sum Up
- 15.6 Questions
- 15.7 Suggesting Readings

UNIT 16: COMMERCIAL CINEMA

Page No. 195- 206

- 16.0- Objectives
- 16.1- Introduction
- 16.2- Commercial cinema
 - 16.2.1- Historical Evolution of commercial cinema
 - 16.2.2- Commercial cinema and Cultural significance
 - 16.2.3- Business Dynamics and Market Trends
 - 16.2.4- Genre Proliferation and Narrative Tropes
 - 16.2.5- Future Prospects and Challenges

- 16.3- Characteristics of Commercial cinema
- 16.4- Advantages and Disadvantages of Commercial cinema
- 16.5- Let Us Sum Up
- 16.6- Questions
- 16.7- Suggesting Readings

UNIT 17: REGULATORY BODIES OF INDIAN CINEMA

Page No. 207- 216

- 17.0- Objectives
- 17.1- Introduction
- 17.2- Regulatory bodies of Indian Cinema
 - 17.2.1- Central Board of Film Certification
 - 17.2.2- National Film Development Corporation
 - 17.2.3- Ministry of Information and Broadcasting
 - 17.2.4- Film and Television Institute of India
 - 17.2.5- National Film Archive of India
- 17.3- Regulatory bodies of Indian Cinema pros and cons
- 17.4- Characteristics of Regulatory Bodies of Indian cinema
- 17.5- Regulatory Bodies of Indian Cinema Governance
- 17.6- Let Us Sum Up
- 17.7- Questions
- 17.8- Suggesting Readings



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CENTRE FOR DISTANCE
AND ONLINE EDUCATION

BACHELOR OF JOURNALISM
AND
MASS COMMUNICATION
Print Media

JMO- 1201



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COURSE NAME: PRINT MEDIA
COURSE CODE: JMO-1201

BLOCK 1

UNIT 1: NEWS: DEFINITION & TYPE, NEWS BEATS, SOURCES OF NEWS, ELEMENTS OF NEWS **Page No. 01 – 14**

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Definition of the news
- 1.3 Determinant of the news
- 1.4 News values
- 1.5 Types of the news
- 1.6 News beats
- 1.7 Sources of the news
- 1.8 Elements of the news
- 1.9 Let sum up
- 1.10 Further reading
- 1.11 Check your progress

UNIT 2: NEWS WRITING STYLE/STRUCTURE OF NEWS STORY **Page No. 15-27**

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Structure of news stories
 - 2.2.1 Inverted pyramid
 - 2.2.2 Hourglass structure
 - 2.2.3 Narrative structure
 - 2.2.4 Dramatic Unity
- 2.3 Let us sum up
- 2.4 Further reading
- 2.5 Check your progress

UNIT 3: HEADLINE, LEAD, INTRO, TYPES LEAD, BODY, NEWS VALUE JUDGMENT
Page No. 28 - 40

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Definition of headline
 - 3.3 Types of headlines
 - 3.3.1 Banner headline
 - 3.3.2 Cross-line headline/Streamer
 - 3.3.3 Flush left headline
 - 3.3.4 Inverted pyramid headline
 - 3.3.5 Kicker headline
 - 3.3.6 Deck headline
- 3.4 Lead or Intro
- 3.5 Body
- 3.6 News values and Judgment
- 3.7 Let sum up
- 3.8 Further reading
- 3.9 Check your progress

UNIT 4: QUALITIES AND RESPONSIBILITIES OF A NEWS REPORTER **Page No.: 41 - 53**

-
- 4.0 Objectives
 - 4.1 Introduction
 - 4.2 New reporter
 - 4.3 Qualities of a news reporter
 - 4.4 Responsibilities of a news reporter
 - 4.5 Responsibilities towards organization
 - 4.5.1 Responsibilities towards sources
 - 4.5.2 Responsibilities towards society and readers
 - 4.5.3 Let sum up
 - 4.6 Further reading
 - 4.7 Check your progress

BLOCK 2

UNIT 5: NEWS WRITING PROCESS

Page No.: 54 - 67

-
- 5.0 Objectives
 - 5.1 Introduction
 - 5.2 Media writing skills
 - 5.3 Basics of media writing
 - 5.4 Characteristics of media writing
 - 5.5 Types of the news
 - 5.6 News writing process
 - 5.7 Let sum up
 - 5.8 Further reading
 - 5.9 Check your progress
-

UNIT 6: MEDIA INTERVIEW: METHODS, IMPORTANCE & TYPES

Page No. 68 - 83

-
- 6.0 Objectives
 - 6.1 Introduction
 - 6.2 Definition of interview
 - 6.3 Importance of interview
 - 6.4 Types of interview
 - 6.5 Preparation for conducting interview
 - 6.6 Techniques for conducting interview
 - 6.7 Presentation of an interview for print media
 - 6.8 Presentation of an interview for electronic media
 - 6.9 Ethical issues of the interview
 - 6.10 Let Us Sum up
 - 6.11 Further reading
 - 6.12 Check your progress
-

UNIT 7: BOOK REVIEW AND FILM REVIEW

- Page No. 84 - 103

-
- 7.0 Objectives
 - 7.1 Introduction
 - 7.2 What is book review?
 - 7.3 Types of book review
 - 7.4 Purpose of book review
 - 7.5 Preparation for writing book review
 - 7.6 Presentation of a book review
 - 7.7 What is film review?
 - 7.8 Types of film review
 - 7.9 Writing process of film review
 - 7.10 Let Us Sum up
 - 7.11 Further reading
 - 7.12 Check your progress
-

UNIT 8:	FEATURE: DEFINITIONS, IMPORTANCE AND TYPES OF FEATURES
	Page No.: 104 - 116
8.0	Objectives
8.1	Introduction
8.2	Definition of feature
8.3	Importance of feature
8.4	Structure of feature
8.5	Characteristics of feature
8.6	Types of feature
8.7	Follow up feature
8.8	Need for follow up feature
8.9	Let Us Sum up
8.10	Further reading
8.11	Check your progress

BLOCK 3

UNIT 9:	EDITING: MEANING, DEFINITION AND NEED OF EDITING	Page No.: 117 - 129
9.0	Objectives	
9.1	Introduction	
9.2	Editing: Meaning and Definition	
9.3	Need for editing	
9.4	Process of editing	
9.5	Basic rules for editing	
9.6	Types of feature	
9.7	Follow up feature	
9.8	Need for follow up feature	
9.9	Let Us Sum up	
9.10	Further reading	
9.11	Check your progress	

UNIT 10:	HEADLINE: MEANING, DEFINITION AND ITS TYPES	Page No.: 130 - 145
10.0	Objectives	
10.1	Introduction	
10.2	Headline: meaning and definition	
10.3	Characteristics of headlines	
10.4	Functions of headlines	
10.5	Types of headline	
10.6	Let Us Sum up	
10.7	Further reading	
10.8	Check your progress	

UNIT 11:	EDITORIALS AND ITS TYPES, PROOF READER AND PROOF READING SYMBOLS	Page No: 146 - 158
11.0	Objectives	
11.1	Introduction	
11.2	Editorials	
11.3	Types of editorial	
11.4	Importance of editorial	
11.5	Proof reader	
11.6	Importance of proof reading	
11.7	Proof reading symbols	

- 11.8 Let Us Sum up
- 11.9 Further reading
- 11.10 Check your progress

UNIT 12:	PAGE LAYOUT AND DESIGN: STYLE SHEET, LAYOUT AND DUMMY SHEET
	Page No.: 159 - 172

12.0	Objectives
12.1	Introduction
12.2	Style sheet
12.3	Importance of layout sheet
12.4	Page layout
12.5	Stages of page layout
12.6	Elements of layout
12.7	Dummy sheet
12.8	Guidelines for preparing dummy sheet
12.9	Let Us Sum up
12.10	Further reading
12.11	Check your progress

BLOCK 4

UNIT 13:	STRUCTURE OF EDITORIAL DEPARTMENT	Page No.: 173 - 185
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13.0	Objectives
13.1	Introduction
13.2	Editorial department
13.3	Structure of editorial department
13.4	Role of editorial department
13.5	Let Us Sum up
13.6	Further reading
13.7	Check your progress

UNIT 14:	STRUCTURE OF ADVERTISEMENT DEPARTMENT	Page No.: 186 - 201
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14.0	Objectives
14.1	Introduction
14.2	What is advertising?
14.3	Types of advertising
14.4	Advertisement department
14.5	Structure of advertisement department
14.6	Functions of advertisement department
14.7	Let Us Sum up
14.8	Further reading
14.9	Check your progress

UNIT 15:	STRUCTURE OF HUMAN RESOURCES AND CIRCULATION DEPARTMENT
	Page No.: 202 - 215

15.0	Objectives
15.1	Introduction
15.2	Human resource management
15.3	Structure of human resource department
15.4	Function of human resource department
15.5	Circulation department
15.6	Structure of circulation department
15.7	Let Us Sum up
15.8	Further reading
15.9	Check your progress



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Bachelor of Science

ZCO-1211

Biochemistry and Physiology

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Subject Code: ZCO-1211
Subject: Biochemistry and Physiology

L	T	P	C
4	0	0	4

Block 1: Structure and Function of Biomolecules

Unit-1:

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Structure and Biological importance of carbohydrates
 - 1.2.1 Monosaccharides
 - 1.2.2 Disaccharides
 - 1.2.3 Polysaccharides
 - 1.2.4 Glycoconjugates
- 1.3 Lipids
 - 1.3.1 saturated and unsaturated fatty acids
 - 1.3.2 Tri-acylglycerols
 - 1.3.3 Phospholipids
 - 1.3.4 Glycolipids
 - 1.3.5 Steroids
- 1.4 Summary
- 1.5 Keywords
- 1.6 Review Questions
- 1.7 Further Readings

Unit-2:

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Structure of α -amino acids
- 2.3 Classification and General properties
- 2.4 Essential and non-essential α -amino acids
- 2.5 Levels of organization in proteins
- 2.6 Simple and conjugate proteins
- 2.7 Summary
- 2.8 Keywords
- 2.9 Review Questions
- 2.10 Further Readings

Unit-3:

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Nomenclature and classification of enzymes
- 3.3 Cofactors
- 3.4 Specificity of enzyme action
- 3.5 Isozymes
- 3.6 Mechanism of enzyme action
- 3.7 Summary
- 3.8 Keywords
- 3.9 Review Questions

3.10 Further Readings

Unit-4:

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Enzyme kinetics
- 4.3 Factors affecting rate of enzyme-catalyzed reactions
- 4.4 Derivation of Michaelis-Menten equation
- 4.5 Concept of K_m and V_{max}
- 4.6 Lineweaver-Burk plot
- 4.7 Enzyme inhibition
- 4.8 Allosteric enzymes and their kinetics
- 4.9 Regulation of enzyme action
- 4.10 Summary
- 4.11 Keywords
- 4.12 Review Questions
- 4.13 Further Readings

Block 2: Metabolism of Carbohydrates and Lipids

Unit-5:

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Metabolism of Carbohydrates
 - 5.2.1 glycolysis
 - 5.2.2 citric acid cycle
 - 5.2.3 gluconeogenesis
 - 5.2.4 phosphate pentose pathway
 - 5.2.5 Glycogenolysis
 - 5.2.6 Glycogenesis
- 5.3 Summary
- 5.4 Keywords
- 5.5 Review Questions
- 5.6 Further Readings

Unit-6:

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Lipids --- Biosynthesis of palmitic acid
- 6.3 Ketogenesis
- 6.4 β -oxidation
- 6.5 omega -oxidation of saturated fatty acids with even and odd number of carbon atoms
- 5.6 Summary
- 5.7 Keywords
- 5.8 Review Questions
- 5.9 Further Readings

Unit-7:

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Catabolism of amino acids
 - 7.2.1 Transamination
 - 7.2.2 Deamination
 - 7.2.3 Urea cycle
 - 7.2.4 Nucleotides
 - 7.2.5 vitamins
- 7.3 Summary
- 7.4 Keywords
- 7.5 Review Questions
- 7.6 Further Readings

Unit-8:

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Review of mitochondrial respiratory chain
- 8.3 Oxidative phosphorylation and its regulation
- 8.4 Summary
- 8.5 Keywords
- 8.6 Review Questions
- 8.7 Further Readings

Block 3: Digestion and Respiration

Unit-9:

- 9.0 Objectives
- 9.1 Introduction
- 9.2 gastrointestinal tract and associated glands
 - 9.2.1 Structural organization
 - 9.2.2 functions
- 9.3 Mechanical and chemical digestion of food
- 9.4 Absorptions
 - 9.4.1 carbohydrates
 - 9.4.2 lipids
 - 9.4.3 proteins
 - 9.4.4 water
 - 9.4.5 minerals
 - 9.4.6 vitamins
- 9.5 Histology of trachea and lung
- 9.6 Summary
- 9.7 Keywords
- 9.8 Review Questions
- 9.9 Further Readings

Unit-10:

- 10.0 Objectives
- 10.1 Introduction

- 10.2 Mechanism of respiration
- 10.3 Pulmonary ventilation
- 10.4 Respiratory volumes and capacities
- 10.5 Transport of oxygen and carbon dioxide in blood Respiratory pigments
- 10.6 Dissociation curves and the factors influencing it
- 10.7 Control of respiration
- 10.8 Summary
- 10.9 Keywords
- 10.10 Review Questions
- 10.11 Further Readings

Unit-11:

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Components of blood and their functions
- 11.3 Haemostasis
 - 11.3.1 Blood clotting system
- 11.4 Blood groups
 - 11.4.1 Rh factor
 - 11.4.2 ABO
 - 11.4.3 MN
- 11.5 Summary
- 11.6 Keywords
- 11.7 Review Questions
- 11.8 Further Readings

Unit-12:

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Structure of mammalian heart
- 12.3 Cardiac cycle
- 12.4 Cardiac output and its regulation
- 12.5 Electrocardiogram
- 12.6 Blood pressure and its regulation
- 12.7 Structure of kidney and its functional unit
- 12.8 Mechanism of urine formation
- 12.9 Summary
- 12.10 Keywords
- 12.11 Review Questions
- 12.12 Further Readings

Block 4: Nervous System and Endocrinology

Unit-13:

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Structure of neuron
- 13.3 resting membrane potential

- 13.4 Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers
- 13.5 Types of synapse
- 13.6 Summary
- 13.7 Keywords
- 13.8 Review Questions
- 13.9 Further Readings

Unit-14:

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Endocrine glands
 - 14.2.1 pineal
 - 14.2.2 pituitary
 - 14.2.3 thyroid
 - 14.2.4 parathyroid
 - 14.2.5 pancreas
 - 14.2.6 adrenal
- 14.3 Classification of hormones
- 14.4 Mechanism of Hormone action
- 14.5 Summary
- 14.6 Keywords
- 14.7 Review Questions
- 14.8 Further Readings

Unit-15:

- 15.0 Objectives
- 15.1 Introduction
- 15.2 Muscular System Histology of different types of muscle
- 15.3 Ultra structure of skeletal muscle
- 15.4 Molecular and chemical basis of muscle contraction
- 15.5 Characteristics of muscle twitch
- 15.6 Motor unit
- 15.7 summation and tetanus
- 15.8 Summary
- 15.9 Keywords
- 15.10 Review Questions
- 15.11 Further Readings

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Bachelor of Science

BDO -1111

Microbiology & Plant Pathology

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Subject Code: BDO-1111
Subject: Microbiology & Plant Pathology

L	T	P	C
4	0	0	4

Block-I: Introduction to Indian ancient,

Unit-1:

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Vedic and heritage Botany
- 1.3 contribution of Indian Botanists
- 1.4 Summary
- 1.5 Keywords
- 1.6 Review Questions
- 1.7 Further Readings

Unit-2:

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Microscopy –Light, phase contrast
- 2.3 electron
- 2.4 scanning and transmission electron microscopy
- 2.5 staining techniques for light microscopy
- 2.5 sample preparation for electron microscopy.
- 2.6 Summary
- 2.7 Keywords
- 2.8 Review Questions
- 2.9 Further Readings

Unit 3:

- 3.0 Objectives
- 3.2 Introduction
- 3.3 principle working
 - 3.3.1 autoclave
 - 3.3.2 oven
 - 3.3.3 laminar air flow
 - 3.3.4 centrifuge
- 3.4 Colorimetry and spectrophotometry
- 3.5 immobilization methods
- 3.6 fermentation and fermenters.
- 3.7 Summary
- 3.8 Keywords
- 3.9 Review Questions
- 3.10 Further Readings

Unit-4:

- 4.0 Objectives
- 4.1 Introduction

- 4.2 Cell structure of Eukaryotic and prokaryotic cells
- 4.3 Gram positive and Gram-negative bacteria
- 4.4 Structure of a bacteria; Bacterial Chemotaxis and Quorum sensing
- 4.5 Bacterial Growth curve
- 4.6 factors affecting growth of microbes
- 4.7 measurement of growth
- 4.8 Batch culture
- 4.9 fed batch culture and continuous culture
- 4.10 Synchronous growth of microbes
- 4.11 Sporulation and reproduction and recombination in bacteria.
- 4.12 Summary
- 4.13 Keywords
- 4.14 Review Questions
- 4.15 Further Readings

Unit-5:

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Viruses
 - 5.2.1 general characteristics
 - 5.2.2 viral culture
 - 5.2.3 Structure of viruses
- 5.3 Bacteriophages
- 5.4 Structure of T4 & λ -phage
- 5.5 Lytic and Lysogenic cycles
- 5.6 viroid, Prions & mycoplasma & phytoplasma
- 5.7 Actinomycetes & plasmids and their economic uses.
- 5.8 Summary
- 5.9 Keywords
- 5.10 Review Questions
- 5.11 Further Readings

Block-2

Unit-6:

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Range of thallus organization in Algae
- 6.3 Pigments
- 6.4 Reserve food –Reproduction - Classification and life cycle
 - 6.4.1 *Nostoc*
 - 6.4.2 *Chlorella*
 - 6.4.3 *Volvox*
 - 6.4.4 *Hydrodictyon*
 - 6.4.5 *Oedogonium*
 - 6.4.6 *Chara*
 - 6.4.7 *Sargassum*

6.4.8 *Ectocarpus*

6.4.9 *Polysiphonia*

6.5 Summary

6.6 Keywords

6.7 Review Questions

6.8 Further Readings

Unit-7

7.0 Objectives

7.1 Introduction

7.2 Economic importance of algae

7.3 Role of algae in soil fertility

7.3.1 biofertilizer

7.3.2 Nitrogen fixation- Symbiosis

7.4 Commercial products of algae

7.4.1 biofuel

7.4.2 Agar

7.5 Summary

7.6 Keywords

7.7 Review Questions

7.8 Further Readings

Unit-8

8.0 Objectives

8.1 Introduction

8.2 General characteristics

8.3 nutrition, life cycle

8.4 Economic importance of Fungi

8.5 Classification upto class

8.6 Distinguishing characters of Myxomycota

8.7 Summary

8.8 Keywords

8.9 Review Questions

8.10 Further Readings

Unit-9

9.0 Objectives

9.1 Introduction

9.2 General characters of Mastigomycotina

9.2.1 Zygomycota

9.2.2 *Rhizopus*

9.3 **Ascomycota:** *Saccharomyces, Penicillium, Peziza.*

9.4 **Basidiomycotina:** *Ustilago, Puccinia, Agaricus*

9.5 **Deuteromycotina:** *Fusarium, Alternaria.* Heterothallism, Physiological specialization, Heterokaryosis &Parasexuality.

9.6 Summary

9.7 Keywords

9.8 Review Questions

9.9 Further Readings

Block-3 Mushroom Cultivation, Lichenology & Mycorrhiza

Unit-10

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Mushroom cultivation
- 10.3 General account of lichens
- 10.4 reproduction and significance
- 10.5 *Mycorrhiza*
- 10.6 *ectomycorrhiza*
- 10.7 *endomycorrhiza*
- 10.8 Summary
- 10.9 Keywords
- 10.10 Review Questions
- 10.11 Further Readings

Unit-11

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Disease concept
- 11.3 Symptoms
- 11.4 Etiology & causal complex
- 11.5 Primary and secondary inoculum
- 11.6 Infection
- 11.7 Pathogenicity and pathogenesis.
- 11.8 Summary
- 11.9 Keywords
- 11.10 Review Questions
- 11.11 Further Readings

Unit-12

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Koch's Postulates
- 12.3 Mechanism of infection (Brief idea about Pre-penetration, Penetration and Postpenetration)
- 12.4 Summary
- 12.5 Keywords
- 12.6 Review Questions
- 12.7 Further Readings

Unit-13

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Disease cycle (monocyclic, polycyclic and polyetic)

- 13.3 Defense mechanism with special reference to Phytoalexin
- 13.4 Resistance- Systemic acquired and Induced systemic
- 13.5 fungicides- Bordeaux mixture
- 13.6 Lime Sulphur
- 13.7 Tobacco decoction
- 13.8 Neem cake & oil
- 13.9 Summary
- 13.10 Keywords
- 13.11 Review Questions
- 13.12 Further Readings

Block-4 Diseases and Control

Unit-14

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Symptoms
- 14.3 Causal organism
- 14.4 Disease cycle and Control measures of –Early
- 14.5 Late Blight of Potato
- 14.6 False Smut
- 14.7 Summary
- 14.8 Keywords
- 14.9 Review Questions
- 14.10 Further Readings

Unit-15

- 15.0 Objectives
- 15.1 Introduction
- 15.2 Rice/ Brown spot of rice
- 15.3 Black Stem Rust of Wheat
- 15.4 *Alternaria* spot' and 'White rust of Crucifers
- 15.5 Red Rot of Sugarcane
- 15.6 Wilting of Arhar
- 15.7 Mosaic diseases on tobacco and cucumber
- 15.8 yellow vein mosaic of bhindi; Citrus Canker
- 15.9 Little leaf of brinjal; Damping off of seedlings.
- 15.10 Summary
- 15.11 Keywords
- 15.12 Review Questions
- 15.13 Further Readings

Unit-16

- 16.0 Objectives
- 16.1 Introduction
- 16.2 Disease management
 - 16.2.1 Quarantine Chemical

16.2.2 Biological

16.2.3 Integrated pest disease management

16.4 Summary

16.5 Keywords

16.6 Review Questions

16.7 Further Readings

Unit-17

17.0 Objectives

17.1 Introduction

17.2 Food fermentations and food produced by microbes

17.3 amino acids, Production of antibiotics

17.4 enzymes, vitamins, alcoholic beverages

17.5 organic acid & genetic recombinant vaccines

17.6 Mass production of bacterial biofertilizers

17.7 blue green algae

17.8 Summary

17.9 Keywords

17.10 Review Questions

17.11 Further Readings

Books Recommended/Suggested Reading:

1. Lodish et al: Molecular Cell Biology: Freeman & Co, USA (2004).
2. Alberts et al: Molecular Biology of the Cell: Garland (2002).
3. Cooper: Cell: A Molecular Approach: ASM Press (2000).
4. Karp: Cell and Molecular Biology: Wiley (2002). Pierce B. Genetics. Freeman (2004).
5. Lewin B. Genes VIII. Pearson (2004).
6. Watson et al. Molecular Biology of the Gene. Pearson (2004).
7. Thomas J. Kindt, Richard A. Goldsby, Barbara A. Osborne, Janis KubyKuby Immunology. W
8. Delves Peter J., Martin Seamus J., Burton Dennis R., Roitt Ivan M. Roitt's Essential Immunology, 13th Edition. Wiley Blackwell (2017).
9. Shetty Nandini Immunology Introductory Textbook. New Age International. (2005)

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Inorganic Chemistry

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BLOCK I: ATOMIC STRUCTURE

UNIT 1:

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Theories of atoms
 - 1.2.1 Democritus Model
 - 1.2.2 John Dalton Model
 - 1.2.3 J. J. Thomson Model
 - 1.2.4 Ernest Rutherford Model
 - 1.2.5 James Chadwick Model
 - 1.2.6 Niels Bohr Model
 - 1.2.7 Erwin Schrodinger Model
- 1.3 Review of: Bohr's theory and its limitations
- 1.4 Dual Behaviour of matter and Wave
- 1.5 Idea of de Broglie matter wave
- 1.6 Heisenberg's Uncertainty Principle
- 1.7 Hydrogen atom spectra. Need of a new approach to Atomic structure.
- 1.8 Summary
- 1.9 Keywords
- 1.10 Review Questions
- 1.11 Further Readings

UNIT 2:

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Idea of de-Broglie matter waves
- 2.3 Heisenberg uncertainty principle
- 2.4 Atomic orbitals
- 2.5 Schrodinger wave equation (No derivation)
 - 2.5.1 Significance of ψ and ψ^2
 - 2.5.2. Radial and angular wave functions
 - 2.5.3. Probability distribution curve
- 2.6 Shape of different orbitals
- 2.7 Quantum Numbers
- 2.8 Pauli's Exclusion Principles
- 2.9 Hund's rule of maximum multiplicity
- 2.10 Aufbau principle
- 2.11 Electronic configuration of the elements
- 2.12 Effective nuclear charge
- 2.13 Summary
- 2.14 Keywords
- 2.15 Review Questions
- 2.16 Further Readings

UNIT 3:

- 3.0 Objectives
- 3.1 Introduction
- 3.2 History of Periodic
- 3.3 Laws of Periodic
 - 3.3.1 Mendeleev's Law, merits and defects of Mendeleev's periodic table.
 - 3.3.2 Modified form of Mendeleev's periodic table
 - 3.3.3 Lothar Meyer's rearrangement.
 - 3.3.4 Modern periodic law (Moseley's periodic law), merits and demerits of modern periodic table.
- 3.4 Cause of periodicity
- 3.5 Nomenclature of the element
- 3.6 Periodicity of properties
- 3.7 Summary
- 3.8 Keywords
- 3.9 review Questions
- 3.10 Further readings

BLOCK II: CHEMICAL BONDING

UNIT 4:

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Periodic Properties
 - 4.2.1 Atomic and ionic radii
 - 4.2.2 Ionization energy
 - 4.2.3 Electron affinity
 - 4.2.4 Electronegativity
- 4.3 Trends in periodic table
- 4.4 Summary
- 4.5 Keywords
- 4.6 Review Questions
- 4.7 Further Readings

UNIT 5:

- 5.0 Objectives
- 5.1 Introduction
 - 5.1.1 Chemical Bond
 - 5.1.2 Types of bond
- 5.3 Covalent bond
 - 5.3.1 Valence bond theory and its limitation
 - 5.3.2 Directional characteristics of covalent bond
 - 5.3.3 Sigma and pi covalent bond
- 5.4 Hybridization of atomic orbitals
 - 5.4.1 Types of hybridization
 - 5.4.2 Shape of simple inorganic molecules and ions
- 5.5 Valence shell electron pair repulsion theory (VSEPR) theory
- 5.6 Molecular Orbital theory
 - 5.6.1 Homonuclear diatomic molecules
 - 5.6.2 Heteronuclear (CO and MO) diatomic molecules
- 5.7 Multicenter bonding in electron deficient molecules

- 5.8 Bond strength
 - 5.8.1 Bond energy
 - 5.8.2 Measurement of bond energy
- 5.9 Percent ionic character
- 5.10 Summary
- 5.11 Keywords
- 5.12 Review Questions
- 5.13 Further Readings

UNIT 6:

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Introduction
- 6.3 Ionic solids
 - 6.3.1 Characteristics of ionic solids
 - 6.3.2 Crystal coordination number
 - 6.3.3 Radius ratio
 - 6.3.4 Limitation of radius ratio rule
- 6.4 Lattice defects
- 6.5 Semiconductors
- 6.6 Lattice energy of ionic crystals
- 6.7 Born-Haber Cycle; experimental determination of lattice energy
- 6.8 Fajan's Rule: polarization of ions
- 6.9 Weak interactions
 - 6.9.1 Hydrogen bonding
 - 6.9.2 van der Waals' Forces
- 6.10 Summary
- 6.11 Keywords
- 6.12 Review Questions
- 6.13 Further readings

BLOCK III: ALKALI AND ALKALINE EARTH METALS

UNIT 7:

- 7.0 Objectives
- 7.1 Introduction
- 7.3 Protic and aprotic solvents
 - 7.3.1 Isomers of hydrogen
- 7.4 Reactions in non-aqueous solvents
- 7.5 Summary
- 7.6 Keywords
- 7.7 Review Questions
- 7.8 Further Readings

UNIT 8:

- 8.0 Objectives
- 8.1 Objectives
- 8.2 Introduction
- 8.3 General characteristics and use (Flame Colouration)

- 8.4 Oxides and Hydroxides
- 8.5 Solubility and hydration
- 8.6 Complexation of alkali metal ions
- 8.7 Anomalous Behavior of Lithium.
- 8.8 Summary
- 8.9 Keywords
- 8.10 Review Questions
- 8.11 Further Readings

UNIT 9:

- 9.0 Objectives
- 9.2 Introduction
- 9.3 General characteristics and uses
- 9.4 Halides and hydrides of beryllium
 - 9.4.1 Preparation and properties of Be-halides
 - 9.4.2 Preparation and properties of BeO hydrides
- 9.5 Complexation behaviour of alkaline earth metals
- 9.6 Anomalous behaviour of Beryllium
- 9.7 Summary
- 9.8 Keywords
- 9.9 Review Questions
- 9.10 Further Readings

BLOCK IV: GROUP 13, 14 AND 15 ELEMENTS

UNIT 10:

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Introduction
- 10.3 General characteristics and uses
- 10.4 Hydrides of boron diborane and borazine
 - 10.4.1 Diborane
 - 10.4.2 Borazine
- 10.5 Halides of boron and aluminium
 - 10.5.1 Boron trihalides
 - 10.5.2 Aluminium halides
- 10.6 Oxides of boron and borates
 - 10.6.1 Oxides of boron
 - 10.6.2 Borates
- 10.7 Anomalous behaviour of boron
- 10.8 Summary
- 10.9 Keywords
- 10.10 Review Questions
- 10.11 Further Readings

UNIT 11:

- 11.0 Objectives
- 11.1 Introduction
- 11.2 General characteristics

- 11.3 Oxides of carbon and silicon
 - 11.3.1 Oxides of carbon
 - 11.3.2 Silicon oxide
- 11.4 Halides of carbon
- 11.5 Organosilicon compounds: silicones
- 11.6 Anomalous behaviour of carbon
- 11.7 Summary
- 11.8 Keywords
- 11.9 Review Questions
- 11.10 Further Readings

UNIT 12:

- 12.0 Objectives
- 12.1 Introduction
- 12.2 General characteristics
 - 12.2.1 Electronic configuration
 - 12.2.2 Occurrence
 - 12.2.3 Physical state and elemental structure
 - 12.2.4 Metallic and nonmetallic character
 - 12.2.5 Density, hardness, atomic radii and atomic volume
 - 12.2.6 Ionization energy, electronegativity and heat of atomization
 - 12.2.7 Melting and boiling points
 - 12.2.8 Oxidation states
 - 12.2.9 Electron donor-acceptor properties
 - 12.2.10 Allotropy
 - 12.2.1.1 Catenation
 - 12.2.1.2 Electrical and thermal conductivity
 - 12.2.1.3 Combination with active metals
 - 12.2.1.4 Chemical reactivity
- 12.3 Hydrides of elements
 - 12.3.1 Preparation
 - 12.3.2 Properties
- 12.4 Halides of elements
 - 12.4.1 Preparation
 - 12.4.2 Properties
 - 12.4.3 Structure
- 12.5 Oxides and oxo acids of elements
 - 12.5.1 Properties and structures of oxides
 - 12.5.2 Oxyacids
- 12.6 Anomalous behavior of Nitrogen
- 12.7 Summary
- 12.8 Keywords
- 12.9 Review Questions
- 12.10 Further Readings

BLOCK V: GROUP 16, 17 AND 18 ELEMENTS

UNIT 13:

- 13.0 Objectives
- 13.1 Introduction

- 13.2 General characteristics and uses
- 13.3 Oxides of sulphur
 - 13.3.1 Sulphur dioxide
 - 13.3.1.1 Preparation
 - 13.3.1.2 Properties
 - 13.3.1.3 Uses
 - 13.3.1.4 Structure
 - 13.3.2 Sulphur trioxide
 - 13.3.2.1 Preparation
 - 13.3.2.2 Properties
 - 13.3.2.3 Uses
 - 13.3.2.4 Structure
- 13.4 Oxoacids of sulphur
 - 13.4.1 Sulphurous acid series
 - 13.4.1.1 Sulphurous acid
 - 13.4.1.2 Thiosulphurous acid
 - 13.4.1.3 Hyposulphurous acid
 - 13.4.1.4 Pyrosulphurous acid
 - 13.4.2 Sulphuric acid series
 - 13.4.2.1 Sulphuric acid
 - 13.4.2.2 Thiosulphuric acid
 - 13.4.2.3 Pyrosulphuric acid
 - 13.4.3 Peroxysulphuric acid series
 - 13.4.3.1 Peroxymonosulphuric acid
 - 13.4.3.2 Peroxydisulphuric acid
 - 13.4.4 Thionic acid series
 - 13.4.4.1 Dithionic acid
 - 13.4.4.2 Polythionic acid
- 13.5 Halides of sulphur and their properties
 - 13.5.1 Preparation, properties and structure of sulphur halides
 - 13.5.1.1 Dihalides
 - 13.5.1.2 Tetrahalides

 - 13.5.2 Preparation, properties and structure of sulphur halides
- 13.6 Anomalous behaviour of oxygen
- 13.7 Summary
- 13.8 Keywords
- 13.9 Review Questions
- 13.10 Further Readings

UNIT 14:

- 14.0 Objectives
- 14.1 Introduction
- 14.2 General characteristics and uses
 - 14.2.1 Physical properties of halogens
 - 14.2.1.1 Physical state
 - 14.2.1.2 Melting and boiling point
 - 14.2.1.3 Ionization potential
 - 14.2.1.4 Electronegativity
 - 14.2.1.5 Electron affinity

- 14.2.1.6 Odour
- 14.2.1.7 Non metallic character
- 14.2.1.8 Bond energy and reactivity
- 14.2.1.9 Oxidation state
- 14.2.1.10 Stability of halogens
- 14.2.2 Chemical properties
- 14.3 Halides and halogen oxides
 - 14.3.1 Characteristics of hydrogen halides
 - 14.3.2 Oxides of halogens
- 14.4 Oxoacids of halogens
 - 14.4.1 Oxoacids of chlorine
 - 14.4.2 Oxoacids of bromine
 - 14.4.3 Oxoacids of iodine
- 14.5 Interhalogen compounds
- 14.6 Polyhalides
- 14.7 Basic properties of halogen
- 14.8 Anomalous behavior of fluorine
- 14.9 Summary
- 14.10 Keywords
- 14.11 Review Questions
- 14.12 Further Readings

UNIT 15:

- 15.0 Objectives
- 15.1 Introduction
- 15.2 General characteristics and uses
- 15.3 Compounds of Noble gases
 - 15.3.1 Compounds formation under excited state conditions
 - 15.3.2 Compounds formation through coordination
 - 15.3.3 Compounds formation through dipole induced dipole interaction
 - 15.3.4 Compounds formation through physical trapping.
- 15.4 Compounds of xenon
 - 15.4.1 Structure and bonding in xenon compounds
 - 15.4.2 Theories of bonding in xenon compounds
- 15.5 Summary
- 15.6 Keywords
- 15.7 Review Questions
- 15.8 Further Readings

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BACHELOR OF SCIENCE

PHO-1111

Mechanics and Wave Motion

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Course Name: Mechanics and Wave Motion

Course Code: PHO-1111

Credits: 4

Block – 1: Dynamics of System of Particles

Unit-1: Frame of reference

- 1.0 Objectives
- 1.1 Introduction
- 1.2 Inertial and Non-inertial reference frames,
- 1.3 Newton's laws of motion,
- 1.4 Galilean Transformations
- 1.5 Galilean Invariance
- 1.6 Summary
- 1.7 Keywords
- 1.8 Review questions
- 1.9 Further readings

Unit-2: Conservative and non conservative forces

- 2.0 Objectives
- 2.1 Introduction
- 2.2 Work
- 2.3 kinetic and potential energy
- 2.4 Conservative and Non-conservative forces
- 2.5 Summary
- 2.6 Keywords
- 2.7 Review questions
- 2.8 Further readings

Unit-3: Linear momentum

- 3.0 Objectives
- 3.1 Introduction
- 3.2 Conservation of energy
- 3.3 linear momentum
- 3.4 Summary
- 3.5 Keywords
- 3.6 Review questions
- 3.7 Further readings

Unit-4: Collision in one and two dimensions

- 4.0 Objectives
- 4.1 Introduction
- 4.2 Collision in one and two dimensions
- 4.3 Summary
- 4.4 Keywords
- 4.5 Review questions
- 4.6 Further readings

Block – 2: Rotational Mechanics

Unit-5: Angular momentum and Torque

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Angular momentum and Torque
- 5.3 Summary
- 5.4 Keywords
- 5.5 Review questions
- 5.6 Further readings

Unit-6: Angular momentum and Torque

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Angular momentum and Torque
- 6.3 Summary
- 6.4 Keywords
- 6.5 Review questions
- 6.6 Further readings

Unit-7: Rotational energy and rotational inertia for simple bodies

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Rotational energy and rotational inertia for simple bodies
- 7.3 Summary
- 7.4 Keywords
- 7.5 Review questions
- 7.6 Further readings

Unit-8: Combined translation and rotational and motion of a rigid body on horizontal and inclined planes

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Combined translation and rotational and motion of a rigid body on horizontal and inclined planes
- 8.3 Simple treatment of the motions of a top

- 8.4 Summary
- 8.5 Keywords
- 8.6 Review questions
- 8.7 Further readings

Unit-9: Relations between elastic constants

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Relations between elastic constants
- 9.3 bending of Beams and Torsion of Cylinder
- 9.4 Summary
- 9.5 Keywords
- 9.6 Review questions
- 9.7 Further readings

Block – 3: Rotational Mechanics

Unit-10: Law of gravitation

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Law of gravitation
- 10.3 Potential and Field due to Spherical Shell and Solid Sphere
- 10.4 Summary
- 10.5 Keywords
- 10.6 Review questions
- 10.7 Further readings

Unit-11: Escape and orbital velocity

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Escape and orbital velocity
- 11.3 Kepler's laws
- 11.4 Summary
- 11.5 Keywords
- 11.6 Review questions
- 11.7 Further readings

Unit-12: Motions of planets and satellites Geo-stationary satellites

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Motions of planets and satellites Geo-stationary satellites
- 12.3 Summary
- 12.4 Keywords
- 12.5 Review questions

12.6 Further readings

Unit-13: Central forces

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Central forces
- 13.3 Two particle central force problem
- 13.4 Reduced mass
- 13.5 Summary
- 13.6 Keywords
- 13.7 Review questions
- 13.8 Further readings

Block – 4: Simple Harmonic Motion

Unit-14: Law of gravitation

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Law of gravitation
- 14.3 differential equation of S. H. M. and its solution
- 14.4 Summary
- 14.5 Keywords
- 14.6 Review questions
- 14.7 Further readings

Unit-15: Applications and uses of complex notation

- 15.0 Objectives
- 15.1 Introduction
- 15.2 Applications and uses of complex notation
- 15.3 Summary
- 15.4 Keywords
- 15.5 Review questions
- 15.6 Further readings

Unit-16: Damped harmonic oscillator

- 16.0 Objectives
- 16.1 Introduction
- 16.2 Damped harmonic oscillator
- 16.3 Summary
- 16.4 Keywords
- 16.5 Review questions

16.6 Further readings

Unit-17: composition of simple harmonic motion

- 17.0 Objectives
- 17.1 Introduction
- 17.2 Forced vibrations
- 17.3 composition of simple harmonic motion
- 17.4 Summary
- 17.5 Keywords
- 17.6 Review questions
- 17.7 Further readings

Block – 5: Wave Motion

Unit-18: Differential equation of wave motion

- 18.0 Objectives
- 18.1 Introduction
- 18.2 Differential equation of wave motion
- 18.3 Plane progressive waves in fluid media
- 18.4 Summary
- 18.5 Keywords
- 18.6 Review questions
- 18.7 Further readings

Unit-19: Reflection of waves

- 19.0 Objectives
- 19.1 Introduction
- 19.2 Reflection of waves
- 19.3 phase change on reflection
- 19.4 Summary
- 19.5 Keywords
- 19.6 Review questions
- 19.7 Further readings

Unit-20: pressure and energy distribution

- 20.0 Objectives
- 20.1 Introduction
- 20.2 Superposition
- 20.3 stationary waves
- 20.4 pressure and energy distribution
- 20.5 phase and group velocity

20.6 Summary

20.7 Keywords

20.8 Review questions

20.9 Further readings

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MAO-1111

Calculus

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Course Name: Calculus

Course Code: MAO-1111

Credits: 4

Block I: Limit, Continuity and Differentiability

Unit 1: ϵ - δ definition of the limit of a function and algebra of limits

1.0 Objectives

1.1 Introduction

1.2 Limit

1.3 Theorem on limits

1.4 Algebra of limits

1.5 Summary

1.6 Keywords

1.7 Review Questions

1.8 Further Readings

Unit 2: Continuous functions and Classification of discontinuities

2.0 Objectives

2.1 Introduction

2.2 Continuity of a function

2.2.1 Properties of Continuous functions

2.3 Classification of discontinuities

2.4 Summary

2.5 Keywords

2.6 Review Questions

2.7 Further Readings

Unit 3: Differentiability and Chain rule of differentiability

3.0 Objectives

3.1 Introduction

3.2 Differentiability

3.3 Some general theorems on differentiation

3.3.1 Derivative of a function of a function

3.4 Chain rule of differentiability

3.5 Summary

3.6 Keywords

3.7 Review Questions

3.8 Further Readings

Unit 4: Successive differentiation and Leibnitz's theorem

4.0 Objectives

4.1 Introduction

4.2 Successive differentiation

4.2.1 Some standard results

- 4.3 Leibnitz's theorem
- 4.4 Summary
- 4.5 Keywords
- 4.6 Review Questions
- 4.7 Further Readings

Block II: Differential Calculus-I

Unit 5: Rolle's theorem, Lagrange's and Cauchy mean value theorems

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Rolle's theorem
- 5.3 Lagrange's mean theorem
- 5.4 Some deductions from mean value theorem
- 5.5 Cauchy's mean value theorem
- 5.6 Summary
- 5.7 Keywords
- 5.8 Review Questions
- 5.9 Further Readings

Unit 6: Expansion of functions (in Taylor's and Maclaurin's series)

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Taylor's series
- 6.3 Maclaurin's series
- 6.4 Summary
- 6.5 Keywords
- 6.6 Review Questions
- 6.7 Further Readings

Unit 7: Partial differentiation and Euler's theorem

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Partial derivatives
- 7.3 Geometrical interpretation of partial derivatives of first order
- 7.4 Euler's theorem on homogeneous functions
- 7.5 Summary
- 7.6 Keywords
- 7.7 Review Questions
- 7.8 Further Readings

Unit 8: Jacobians, Maxima and Minima (for functions of two variables)

- 8.0 Objectives
- 8.1 Introduction

- 8.2 Jacobians
- 8.3 Maxima and Minima
 - 8.3.1 Necessary condition for extreme values
- 8.4 Criteria for extreme values
- 8.5 Summary
- 8.6 Keywords
- 8.7 Review Questions
- 8.8 Further Readings

Block III: Differential Calculus-II

Unit 9: Tangents and normal (polar form only)

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Tangents and normals
 - 9.2.1 Algebra of intersection of two curves
 - 9.2.2 Polar sub-tangent and sub-normal
 - 9.2.3 Pedal equations
- 9.3 Summary
- 9.4 Keywords
- 9.5 Review Questions
- 9.6 Further Readings

Unit 10: Curvature and Asymptotes

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Curvature
- 10.3 Radius of Curvature
- 10.4 Asymptotes
- 10.5 Summary
- 10.6 Keywords
- 10.7 Review Questions
- 10.8 Further Readings

Unit 11: Tests for concavity and convexity, Points of inflexion

- 11.0 Objectives
- 11.1 Introduction
- 11.2 Concavity and convexity
- 11.3 Points of inflexion
- 11.4 Summary
- 11.5 Keywords
- 11.6 Review Questions
- 11.7 Further Readings

Unit 12: Tracing of curves in cartesian and polar coordinates

- 12.0 Objectives
- 12.1 Introduction
- 12.2 Tracing of curves
- 12.3 Polar curves
- 12.4 Parametric equations
- 12.5 Summary
- 12.6 Keywords
- 12.7 Review Questions
- 12.8 Further Readings

Block IV: Integral Calculus-I

Unit 13: Integral as a limit of sum, Properties of definite integrals

- 13.0 Objectives
- 13.1 Introduction
- 13.2 Integral as a limit of sum
- 13.3 Definite Integral
 - 13.3.1 Properties of definite integrals
- 13.4 Summary
- 13.5 Keywords
- 13.6 Review Questions
- 13.7 Further Readings

Unit 14: Fundamental theorem of integral calculus, Summation of series by integration

- 14.0 Objectives
- 14.1 Introduction
- 14.2 Fundamental theorem of integral calculus
- 14.3 Summation of series by integration
- 14.4 Summary
- 14.5 Keywords
- 14.6 Review Questions
- 14.7 Further Readings

Unit 15: Infinite integrals, Differentiation and integration under the integral sign

- 15.0 Objectives
- 15.1 Introduction
- 15.2 Indefinite integrals
- 15.3 Differentiation and integration under the integral sign
- 15.4 Summary
- 15.5 Keywords
- 15.6 Review Questions
- 15.7 Further Readings

Unit 16: Beta and Gamma functions

- 16.0 Objectives

- 16.1 Introduction
- 16.2 Beta and Gamma functions
- 16.3 Properties of Beta and Gamma functions
- 16.4 Transformation of Beta functions
- 16.5 Transformation of Gamma functions
- 16.6 Summary
- 16.7 Keywords
- 16.8 Review Questions
- 16.9 Further Readings

Block V: Integral Calculus-II

Unit 17: Reduction formulae

- 17.0 Objectives
- 17.1 Introduction
- 17.2 Reduction formulae
- 17.3 Summary
- 17.4 Keywords
- 17.5 Review Questions
- 17.6 Further Readings

Unit 18: Quadrature and Rectification

- 18.0 Objectives
- 18.1 Introduction
- 18.2 Quadrature
- 18.3 Rectification
- 18.4 Summary
- 18.5 Keywords
- 18.6 Review Questions
- 18.7 Further Readings

Unit 19: Volumes and surfaces of solids of revolution

- 19.0 Objectives
- 19.1 Introduction
- 19.2 Volumes of solids of revolution
- 19.3 Surfaces of solids of revolution
- 19.4 Summary
- 19.5 Keywords
- 19.6 Review Questions
- 19.7 Further Readings

Unit 20: Double and triple integrals

- 20.0 Objectives
- 20.1 Introduction
- 20.2 Double integrals

- 20.3 Changing to better coordinates
- 20.4 Triple integrals
- 20.5 Summary
- 20.6 Keywords
- 20.7 Review Questions
- 20.8 Further Readings

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