II YEAR IV SEMESTER BSc MPCs SYLLABUS

SRI RAMAKRISHNA DEGREE COLLEGE (AUTONOMOUS)

NANDYAL

SRI RAMAKRISHNA DEGREE(AUTONOMOUS) COLLEGE: NANDYAL
B.Sc. SECOND YEAR MATHEMATICS SYLLABUS (2021-2022)
SEMESTER – IV, PAPER - 4
REAL ANALASIS-4

UNIT – I (12 Hours)

REAL NUMBERS :

The algebraic and order properties of R, Absolute value and Real line, Completeness property of R, Applications of Supremum property; intervals. (No question is to be set from this portion).

Real Sequences:

Sequences and their limits, Range and Boundedness of Sequences, Limit of a sequence and Convergent sequence. The Cauchy's criterion, properly divergent sequences, Monotone sequences, Necessary and Sufficient condition for Convergence of Monotone Sequence, Limit Point of Sequence, Subsequences and the Bolzano- weierstrass theorem – Cauchy Sequences – Cauchy's general principle of convergence theorem.

UNIT –II (12 Hours)

INFINITIE SERIES :

Series : Introduction to series, convergence of series. Cauchy's general principle of convergence forseries tests for convergence of series, Series of Non-Negative Terms.

1. P-test
2. Cauchy's n^{th} root test or Root Test.
3. D'-Alemberts' Test or Ratio Test.
4. Alternating Series – Leibnitz Test.
5. Absolute convergence and conditional convergence

UNIT – III (12 Hours)

CONTINUITY :

Limits : Real valued Functions, Boundedness of a function, Limits of functions. Some extensionsof the limit concept, Infinite Limits. Limits at infinity. (No question is to be set from this portion).

Continuous functions : Continuous functions, Combinations of continuous functions, Continuous Functions on intervals, uniform continuity.

UNIT – IV (12 Hours)

DIFFERENTIATION AND MEAN VALUE THEORMS :

The derivability of a function, on an interval, at a point, Derivability and continuity of a function, Graphical meaning of the Derivative, Mean value Theorems; Rolle's Theorem, Lagrange's Theorem, Cauchy's Mean value Theorem

UNIT – V (12 Hours)

RIEMANN INTEGRATION :

Riemann Integral, Riemann integral functions, Darboux theorem. Necessary and sufficient condition for R – integrability, Properties of integrable functions, Fundamental theorem of integral calculus, integral asthe limit of a sum, Mean value Theorems.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Real Analysis and its applications / Problem Solving.

Text Book:Introduction to Real Analysis by Robert G.Bartle and Donlad R. Sherbert, published by John Wiley.

Reference Books:

1. A Text Book of B.Sc Mathematics by B.V.S.S. Sarma and others, published by S. Chand & CompanyPvt. Ltd., New Delhi.
2. Elements of Real Analysis as per UGC Syllabus by Shanthi Narayan and Dr. M.D. Raisinghania, published by S. Chand & Company Pvt. Ltd., New Delhi.

SRI RAMAKRISHNA DEGREE (AUTONOMOUS) COLLEGE::NANDYAL
PART-II : MATHEMATICS
FOURTH SEMESTER END EXAMINATIONS
PAPER-IV –REAL ANALYSIS

Time:3 Hrs **Max.Marks:70M**

SECTION – A

Answer any FIVE Questions. **5x4=20M**

1.Show that every convergent sequence is bounded.

2.Test for convergence $\sum \frac{2^n}{n^3}$

3.Test for convergence $1-\frac{1}{2}+\frac{1}{3}-\frac{1}{4}+\cdots$ ... .

4.Examine the continuity of $f(x)=\frac{1-\cos 2x}{1-\cos 4x}$ when x $\neq 0$ and f(0) $= \frac{2}{3}$

5.By using Lagrange's Mean – Value theorem prove that

$\frac{x}{1+x} < log(1+x) < x \; for \; all \; x > 0$

6.Show that $f(x)=|x-1|+|x-2|$ is not derivable at $x=1 \; and \; x=2$

7.Find the Upper and Lower Riemann sums of $f(x)=x^2 \; on \; [0,1]$ for the partition p=$\{0,\frac{1}{2},\frac{2}{3},\frac{3}{4},1\}$

8. If f ∈ R [a ,b] then show that |f|∈ R[a , b].

SECTION – B

Answer any FIVE Questions. **5x10=50M**

9.A) If $s_n=\frac{1}{1.2}+\frac{1}{2.3}+\frac{1}{3.4}+ \; - - - - - \frac{1}{n(n+1)}$ then prove that $\{s_n\}$ is convergent.

OR

B) State and prove Cauchy's General Principle of convergence.

10.A) Test for convergence $\sum_{n=1}^{\infty} \frac{2n-1}{n(n+)(n+2)}$

OR

B) State and prove Leibnitz's Test

11.A) Let f:R→R be such that f(x)=$\frac{\sin(a+1)x+\sin x}{x}$ for x < 0 ,

f(x) = c for x = 0 ,

f(x) =$\frac{(x+bx^2)^{\frac{1}{2}}-x^{\frac{1}{2}}}{bx^{\frac{3}{2}}}$ for x>0 Then determine the values of a, b, c for which the function is continuous at x=0.

OR

B) By using definition prove that $f(x)=x^3$ is uniformly continuous on $[-2,\ 2]$.

12.A)State and Prove Lagrange's Mean-Value theorem.

OR

B)Verify Cauchy's Mean-Value Theorem for the function $f(x) = x^2$, $g(x) = x^3$ in (1,2).

13.A) Prove that $f(x) = x^2$ is Integrable on $[0, a]$ and $\int_0^a x^2\, dx = \frac{a^3}{3}$

OR

B) State and Prove Fundamental theorem in Riemann Integration

SRI RAMAKRISHNA DEGREE(AUTONOMOUS) COLLEGE: NANDYAL
B.Sc. SECOND YEAR MATHEMATICS SYLLABUS (2021-2022)
SEMESTER – IV, PAPER - 5

LINEAR ALGEBRA-5

Course Outcomes:

After successful completion of this course, the student will be able to;

1. understand the concepts of vector spaces, subspaces, basises, dimension and their properties
2. understand the concepts of linear transformations and their properties
3. apply Cayley- Hamilton theorem to problems for finding the inverse of a matrix and higher powers of matrices without using routine methods
4. learn the properties of inner product spaces and determine orthogonality in inner product spaces.

Course Syllabus:

UNIT – I (12 Hours)

VECTOR SPACES-I:

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT –II (12 Hours)

VECTOR SPACES-II:

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of aVector space, Dimension of a subspace, Quotient space and Dimension of Quotient space.

UNIT –III (12 Hours)

LINEAR TRANSFORMATIONS:

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT –IV (12 Hours)

MATRIX :

Matrices, Elementary Properties of Matrices, Inverse Matrices, Rank of Matrix, Linear Equations, Characteristic equations, Characteristic Values & Vectors of square matrix, Cayley – Hamilton Theorem.

UNIT –V (12 Hours)

INNER PRODUCT SPACE :

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram
– Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Co-Curricular Activities(15 Hours)

Seminar/ Quiz/ Assignments/ Linear algebra and its applications / Problem Solving.

Text Book:

Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut- 250002.

Reference Books :

1. Matrices by Shanti Narayana, published by S.Chand Publications.
2. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition),New Delhi.
3. Linear Algebra by Stephen H. Friedberg et. al. published by Prentice Hall of India Pvt. Ltd.4^{th} Edition, 2007.

SRI RAMAKRISHNA DEGREE (AUTONOMOUS) COLLEGE::NANDYAL
PART-II : MATHEMATICS
FOURTH SEMESTER END EXAMINATIONS
PAPER-IV – LINEAR ALGEBRA

Time:3 Hrs **Max.Marks:70M**

SECTION-A

I Answer ANY FIVE of the following **5x4=20M**

1.If S is a Non empty Subset of Vector Space V(F) Then Prove that $L(S)$ is a Subspace

2.Prove that the Set $S = \{(2,1,1,1)(1,3,1,-2)(1,2,-1,3)\}$ is linearly Independent

3.State and Prove Existence Theorem

4.Show that the mapping T:$V_3(R) \to V_2(R)$ is defined by$T(x,y,z) = (x-y, x-z)$is a linear Transformation

5.Find the Characteristic equation of the matrix $A = \begin{bmatrix} 3 & 1 & 1 \\ 2 & 4 & 2 \\ 1 & 1 & 3 \end{bmatrix}$

6.If α, β are two vectors in a Unitary Space Prove That

$$\|\alpha+\beta\|^2 - \|\alpha-\beta\|^2 = 2\|\alpha\|^2 + \|\beta\|^2$$

7.Ifα, β are two Vectors in an inner product Space $V(F)$ then Prove that

$$\|\alpha+\beta\| \leq \|\alpha\| + \|\beta\|$$

8.Prove that $S = \left\{\left(\frac{1}{3}, \frac{-2}{3}, \frac{-2}{3}\right)\left(\frac{2}{3}, \frac{-1}{3}, \frac{2}{3}\right)\left(\frac{2}{3}, \frac{2}{3}, \frac{-1}{3}\right)\right\}$ forms an Orthonormal Set in $V_3(R)$

SECTION-B

I Answer ANY FIVE of the following 5x10=50M

9.The Necessary and Sufficient Condition for a Non empty SubSet W of Vector Space $V(F)$to be a Sub Space is $a, b \in F \ and \ \alpha, \beta \in W \Rightarrow a\alpha + b\beta \in W$

OR

Express the Vector $\alpha = (1. -2.5)$ as a linear Combination of the Vectors $e_1 = (1,1,1), e_2 = (1,2,3), e_3 = (2,-1,1)$

10. If$W_1 \ and \ W_2$ are two Sub Spaces of a finite dimensional Vector Space V(F) Then Show that $dim(W_1 + W_2) = dim(W_1) + dim(W_2) - dim(W_1 \cap W_2)$

OR

If$V(F)$ is a Finite Dimensional Vector Space and W is a Sub Space of $V(F)$ then Show that $dim\left(\frac{V}{W}\right) = dimV - dimW$

11.Find $T(x, y, z)$ where $T: V_3 \to V_3$ is defined By $T(0,1,2) = (3,1,2)$ and $T(1,1,1) = (2,2,2)$

OR

State and Prove Rank –Nullity Theorem

12.Find the Characteristic Values and Characteristic Vectors of the matrix

$$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

OR

By using Cayley-Hamilton Theorem find inverse of the Matrix $A =$

$$\begin{bmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$$

13.State and Prove Cauchy's-Schwarz's Inequality

OR

Apply Gram Schmidt Process Obtain an Orthonormal Basis of $R^3(R)$ from the basis$\{(1,0,0), (1,1,0), (1,1,1)\}$

512-B1

II Year B.Sc.-Physics: IV Semester

Course-IV: ELECTRICITY, MAGNETISM AND ELECTRONICS

UNIT-I

1. Electrostatics:

Gauss's law-Statement and its proof, Electric field intensity due to (i) uniformly charged solid sphere and (ii) an infinite conducting sheet of charge, Deduction of Coulomb's law from Gauss law, Electrical potential, Equipotential surfaces, Potential due to a (i) dipole (ii)uniformly charged sphere

2.Dielectrics:

Dielectrics-Polar and Non-polar dielectrics- Effect of electric field on dielectrics, Dielectric strength, Capacitance of a parallel plate condenser with dielectric slab between the plates, Electric displacement D, electric polarization P, Relation between D, E and P, Dielectricconstant and electric susceptibility.

UNIT-II

3.Magnetostatics:

Biot-Savart's law and its applications: (i) circular loop and (ii) solenoid, Divergence and curl of magnetic field, Ampere's Circuital Law and its application to Solenoid, Hall effect, determination of Hall coefficient and applications.

4.Electromagnetic Induction:

Faraday's laws of electromagnetic induction, Lenz's law, Self induction and Mutual induction,Self inductance of a long solenoid, Mutual inductance of two coils, Energy stored in magnetic field, Eddy currents and Electromagnetic damping

UNIT-III

5.Alternating currents:

Alternating current - Relation between current and voltage in LR and CR circuits, Phasor and Vector diagrams, LCR series and parallel resonant circuit, Q –factor, Power in ac circuits, Power factor.

6.Electromagnetic waves-Maxwell's equations: Idea of displacement current, Maxwell's equations-Derivation, Maxwell's wave equation(with derivation),Transverse nature of electromagnetic waves, Poynting theorem(Statement and proof).

UNIT-IV

7. Basic Electronic devices:

PN junction diode, Zener diode and Light Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator- Transistors and its operation, CB, CE and CC configurations, Input and output characteristics of a transistor in CE mode, Relation between alpha, beta and gamma; Hybrid parameters, Determination of hybrid parameters from transistor characteristics; Transistor as an amplifier.

UNIT-V:

8. Digital Electronics:

Number systems, Conversion of binary to decimal system and vice versa, Binary addition & Binary subtraction (1's and 2's complement methods), Laws of Boolean algebra, De Morgan's laws-Statements and Proofs, Basic logic gates, NAND and NOR as universal gates, Exclusive-OR gate, Half adder and Full adder circuits.

512-B1

Physics Semester-IV

For Mathematics combinations

Paper-IV Electricity, Magnetism and Electronics

Time: 3 Hours Max. Marks: 70

SECTION-A

Answer any **FIVE** questions 5 x 4=20 Marks

1. Deduce Coulomb's law from Gauss law.
2. Define dielectric polarization and dielectric constant.
3. Explain Hall effect and obtain expression for Hall voltage.
4. Derive an expression for the energy stored in magnetic field.
5. Derive an expression for the power in an A.C. circuit.
6. Write down the Maxwell's equations in differential form.
7. Explain how the transistor works as an amplifier.
8. Convert the following:
   (a) $(56)_{10}$ to binary number and (b) $(101101)_2$ to a decimal number.

SECTION-B

Answer **ALL** the questions 5 x 10=50 Marks

9. (a) State and explain Gauss's law in electrostatics.

   OR

   (b) Define **D**, **E** and **P** and obtain the relation between them.
10. (a) Derive an expression for magnetic induction at any point on the axis of a circular current loop.

    OR

    (b) Define Self inductance and derive an expression self inductance of a solenoid.
11. (a) Discuss the theory of LCR series resonance circuit.

    OR

    (b)What is Poynting vector? Derive an expression for Poynting vector using Maxwell's equations.

12. (a) Describe the construction, working and I-V characteristics of p-n junction diode.

    OR

    (c) Explain how the Zener diode can be used as a voltage regulator.
13. (a) State and prove De Morgan's theorems.

    OR

    (b) Show that NAND and NOR gates act aa universal gates.

B.Sc. PHYSICS SYLLABUS UNDER CBCS
For Mathematics Combinations
II Year B.Sc.-Physics: V
MODERN PHYSICS

UNIT-I :

Atomic and Molecular Physics:(12 hrs)

Vector atom model and Stern-Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Spectral terms and spectral notations, Selection rules, Intensity rules, Fine structure of Sodium D-lines, Zeeman effect, Experimental arrangement to study Zeeman effect.

Raman effect, Characteristics of Raman effect, Experimental arrangement to study Raman effect, Quantum theory of Raman effect, Applications of Raman effect.

UNIT-II:

Matter waves & Uncertainty Principle:(12 hrs) Matter waves, de Broglie's hypothesis, Wave length of matter waves, Properties of matter waves, Davisson and Germer's experiment, Phase and group velocities, Heisenberg's uncertainty principle for position and momentum& energy and time, Illustration of uncertainty principle using diffraction of beam of electrons (Diffraction by a single slit)and photons(Gamma ray microscope),Bohr's principle of complementarily.

UNIT-III:

Quantum (Wave) Mechanics:(12 hrs)

Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations-Derivations, Physical interpretation of wave function, Eigen functions, Eigen values, Application of Schrodinger wave equation to (i) one dimensional potential box of infinite height(Infinite Potential Well) and (ii) one dimensional harmonic oscillator

UNIT-IV:

Nuclear Physics:(12 hrs)

Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; *Nuclear forces*: Characteristics of nuclear forces- Yukawa's meson theory; *Nuclear Models*: Liquid drop model, The Shell model, Magic numbers; *Nuclear Radiation detectors*: G.M. Counter, Cloud chamber, Solid State detector; *Elementary Particles*: Elementary Particles and their classification

UNIT-V:

Nano materials:(7hrs)

Nano materials – Introduction, Electron confinement, Size effect, Surface to volume ratio, Classification of nano materials– (0D, 1D, 2D); Quantum dots, Nano wires, Fullerene, CNT, Graphene (Mention of structures and properties),Distinct properties of nano materials (Mention-*mechanical, optical, electrical, and magnetic properties*); Mention of applications of nano materials: (*Fuel cells,Phosphors for HD TV, Next Generation Computer chips, elimination of pollutants, sensors*)

Superconductivity:(5 hrs)

Introduction to Superconductivity, Experimental results-critical temperature, critical magnetic field, Meissner effect , Isotope effect, Type I and Type II superconductors, BCS theory (elementary ideas only),Applications of superconductors

SEMESTER-IV

MODEL PAPER

MODERN PHYSICS – PAPER-V

SECTION -A

Answer any FIVE questions **5x4M=20M**

1. Discuss about L-S and J-J coupling schemes.
2. Describe the characteristics of Raman Effect.
3. Explain the Heisenberg's Uncertainty principle.
4. Determine the wavelength of matter waves.
5. Explain about Eigen functions and Eigen values.
6. Discuss the characteristics of Nuclear forces.
7. Explain the various applications of Nano materials.
8. Discuss isotope effect on superconductors.

SECTION -B

Answer all questions **5x10M=50M**

9. A) Explain various quantum numbers associated with vector atom model.

OR

B) What is Raman Effect? Explain its necessary experiment.

10. A) Discuss about Davisson and Germer's experiment about electron diffraction.

OR

B) Define Heisenberg Uncertainty principle. Verify Uncertainty principle with Gamma ray microscope.

11. A) Derive Schrodinger's time-independent wave equation.

OR

B) Discuss the energy levels of particles in one dimensional infinite potential box by using Schrodinger equation.

12. A) Explain about general properties of Nucleus.

OR

B) Explain about construction and working of cloud chamber.

13. A) Explain the classification of Nano materials.

OR

B) Explain type-1 and Type-2 superconductors.

OBJECT ORIENTATED PROGRAMMING THROUGH JAVA

Semester	Course Code	Course title	Hours	Credits
IV	C4	OBJECT ORIENTATED PROGRAMMING THROUGH	60	3

Objectives:

To introduce the fundamental concepts of Object-Oriented programming and to design &implement object oriented programming concepts in Java.

Course Learning Outcomes: At the end of this course student will:

1. Understand the benefits of a well-structured program
2. Understand different computer programming paradigms
3. Understand underlying principles of Object-Oriented Programming in Java
4. Develop problem-solving and programming skills using OOP concepts
5. Develop the ability to solve real-world problems through software development in high-level programming language like Java

UNIT – I

Introduction to Java: Features of Java, The Java virtual Machine, Parts of Java

Naming Conventions and Data Types: Naming Conventions in Java, Data Types in Java, Literals

Operators in Java: Operators, Priority of Operators

Control Statements in Java: if... else Statement, do... while Statement, while Loop, for Loop, switch Statement, break Statement, continue Statement, return Statement

Input and Output: Accepting Input from the Keyboard, Reading Input with Java.util.Scanner Class, Displaying Output with System.out.printf(), Displaying Formatted Output with String.format()

Arrays: Types of Arrays, Three Dimensional Arrays (3D array), arrayname.length, Command Line Arguments

UNIT – II

Strings: Creating Strings, String Class Methods, String Comparison, Immutability of Strings

Introduction to OOPs: Problems in Procedure Oriented Approach, Features of Object- Oriented Programming System (OOPS)

Classes and Objects: Object Creation, Initializing the Instance Variables, Access Specifiers, Constructors

Methods in Java: Method Header or Method Prototype, Method Body, Understanding Methods, Static Methods, Static Block, The keyword 'this', Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods

Inheritance: Inheritance, The keyword 'super', The Protected Specifier, Types of Inheritance

UNIT – III

Polymorphism: Polymorphism with Variables, Polymorphism using Methods, Polymorphism with Static Methods, Polymorphism with Private Methods, Polymorphism with Final Methods, final Class

Type Casting: Types of Data Types, Casting Primitive Data Types, Casting Referenced Data Types, The Object Class

Abstract Classes: Abstract Method and Abstract Class

Interfaces: Interface, Multiple Inheritance using Interfaces

Packages: Package, Different Types of Packages, The JAR Files, Interfaces in a Package, Creating Sub Package in a Package, Access Specifiers in Java, Creating API Document

Exception Handling: Errors in Java Program, Exceptions, throws Clause, throw Clause, Types of Exceptions, Re – throwing an Exception

UNIT – IV

Streams: Stream, Creating a File using FileOutputStream, Reading Data from a File uingFileInputStream, Creating a File using FileWriter, Reading a File using FileReader, Zipping and Unzipping Files, Serialization of Objects, Counting Number of Characters in a File, File Copy, File Class

Threads: Single Tasking, Multi Tasking, Uses of Threads, Creating a Thread and Running it, Terminating the Thread, Single Tasking Using a Thread, Multi Tasking Using Threads, Multiple Threads Acting on Single Object, Thread Class Methods, Deadlock of Threads, Thread Communication, Thread Priorities, thread Group, Daemon Threads, Applications of Threads, Thread Life Cycle

UNIT – V

Applets: Creating an Applet, Uses of Applets, <APPLET> tag, A Simple Applet, An Applet with Swing Components, Animation in Applets, A Simple Game with an Applet, Applet Parameters

Java Database Connectivity: Database Servers, Database Clients, JDBC (Java Database Connectivity), Working with Oracle Database, Working with MySQL Database, Stages in a JDBC Program, Registering the Driver, Connecting to a Database, Preparing SQL Statements, Using jdbc–odbc Bridge Driver to Connect to Oracle Database, Retrieving Data from MySQL Database, Retrieving Data from MS Access Database, Stored Procedures and CallableStatements, Types of Result Sets

BOOKS:

1. Core Java: An Integrated Approach, Authored by Dr. R. Nageswara Rao &Kogent Learning Solutions Inc.
2. E.Balaguruswamy, Programming with JAVA, A primer, 3e, TATA McGraw- Hill Company.
3. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, TMH.

4. Deitel&Deitel. Java TM: How to Program, PHI (2007)

RECOMMENDED CO-CURRICULAR ACTIVITIES:

(Co-curricular activities shall not promote copying from textbook or from others work and shall encourage self/independent and group learning)

A. Measurable

1. Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
2. Student seminars (on topics of the syllabus and related aspects (individual activity))
3. Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams))
4. Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity

B. General

1. Group Discussion
2. Try to solve MCQ's available online.
3. Others

RECOMMENDED CONTINUOUS ASSESSMENT METHODS:

Some of the following suggested assessment methodologies could be adopted;

1. The oral and written examinations (Scheduled and surprise tests),
2. Closed-book and open-book tests,
3. Programming exercises,
4. Practical assignments and laboratory reports,
5. Observation of practical skills,
6. Individual and group project reports.
7. Efficient delivery using seminar presentations,
8. Viva voce interviews.
9. Computerized adaptive testing, literature surveys and evaluations,
10. Peers and self-assessment, outputs form individual and collaborative work

Semester	Course Code	Course Title	Hours	Credits
IV	C4-P	OBJECT ORIENTATED PROGRAMMING THROUGH JAVA LAB	30	2

1. Write a program to read *Student Name, Reg.No, Marks[5]* and calculate *Total,Percentage, Result*. Display all the details of students

2. Write a program to perform the following String Operations

a. Read a string

b. Find out whether there is a given substring or not

c. Compare existing string by another string and display status

d. Replace existing string character with another character

e. Count number of works in a string

3. Java program to implements Addition and Multiplication of two N X N matrices.

4. Java program to demonstrate the use of Constructor.

5. Calculate area of the following shapes using method overloading.

a. Triangle

b. Rectangle

c. Circle

d. Square

6. Implement inheritance between *Person (Aadhar, Surname, Name, DOB, and Age)* and *Student (Admission Number, College, Course, Year)*classes where ReadData(), DisplayData() are overriding methods.

7. Java program for implementing Interfaces

8. Java program on Multiple Inheritance.

9. Java program for to display *Serial Number from 1 to N* by creating two Threads

10. Java program to demonstrate the following exception handlings

a. Divided by Zero

b. Array Index Out of Bound

c. File Not Found

d. Arithmetic Exception

e. User Defined Exception

11. Create an Applet to display different shapes such as Circle, Oval, Rectangle, Square and Triangle.

12. Write a program to create *Book (ISBN,Title, Author, Price, Pages, Publisher)*structure and store book details in a file and perform the following operations

a. Add book details

b. Search a book details for a given ISBN and display book details, if available c. Update a book details using ISBN

d. Delete book details for a given ISBN and display list of remaining Books

IV Semester: Paper- V

Operating Systems Syllabus(2020-23 Batch)

UNIT- I

What is Operating System? History and Evolution of OS, Basic OS functions, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Real time Systems.

UNIT- II

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process State Diagram, Process Control Block,Process Abstraction, Process Hierarchy, Threads, ,Single and Multi level threads, Process Scheduling, Non-Preemptive and Preemptive Scheduling Algorithms.

UNIT- III

Memory Management: Physical and Virtual Address Space; Memory Allocation Strategies–Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory and Demand Paging

UNIT- IV

Process Management: Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.Concurrent and Dependent Processes, Critical Section.

UNIT- V

File and I/O Management, OS security: Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Security Policy Mechanism, Protection, Authentication and Internal Access Authorization.

Introduction to Android Operating System, Android Development Framework, Android Application Architecture, Android Process Management and File System.

REFERENCE BOOKS:

1. Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne
(7thEdition) Wiley India
Edition.
2. Operating Systems: Internals and Design Principles by Stallings
(Pearson)
3. Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author)
(TMH)

562-B2

Sri Ramakrishna Degree (Autonomous) Degree College: Nandyal

B.Sc (ZCCs) Computer Science-Semester-IV

Paper II- Operating Systems

Time: 3 Hours **Max. Marks: 70**

SECTION-A

Answer any **FOUR** of the following questions **4X5=20 Marks**

1) Write the basic functions of Operating System.
2) Write about Real time Systems.
3) Explain process state diagram.
4) Write about process Abstraction.
5) Write a note on Segmentation.
6) Write about deadlock characteristics.
7) Write about deadlock avoidance.
8) Write about directory structure.

SECTION-B

Answer **ALL** the following questions **5X10=50 Marks**

9) Explain (a) Multi-programming Operating systems
(b) Time Sharing Operating systems

[OR]

10) Explain History & Evolution of operating system

11) Explain about process hierarchy

[OR]

12) Write about primitive scheduling algorithms.

13) Explain memory allocation strategies.

[OR]

14) Write about demand passing segmentation

15) Explain deadlock detection and recovery process

[OR]

16) Write a short note on critical section

17) Write about file allocation methods

[OR]

18) Write about android application architecture.