II YEAR IV SEMESTER BSc MSCs SYLLABUS

SRI RAMAKRISHNA DEGREE COLLEGE (AUTONOMOUS)

NANDYAL

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.

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 $1 - \frac{1}{2} + \frac{1}{3} - \frac{1}{4} + \cdots \dots \dots$

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 $f \in R$ [a ,b] then show that $|f| \in R[a , b]$.

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

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.

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.4th Edition, 2007.

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:$V_3(R) \rightarrow V_2(R)$ 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 $V_3(R)$

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 $\alpha, \beta \in W \Rightarrow a\alpha + b\beta \in W$

<div align="center">OR</div>

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 $dim(W_1 + W_2) = dim(W_1) + dim(W_2) - dim(W_1 \cap W_2)$

<div align="center">OR</div>

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 $T: V_3 \rightarrow V_3$ is defined By $T(0,1,2) = (3,1,2)$ and $T(1,1,1) = (2,2,2)$

<div align="center">OR</div>

   State and Prove Rank –Nullity Theorem

12. Find the Characteristic Values and Characteristic Vectors of the matrix
$$A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$$

<div align="center">OR</div>

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

<div align="center">OR</div>

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

SRI RAMAKRISHNA (AUTONOMOUS) DEGREE COLLEGE

II B.Sc STATISTICS SYLLABUS

Paper IV: Sampling Techniques and Design of Experiment

Unit I

Simple Random sampling (with and without replacement): Notations and terminology, various probabilities of selection Random numbers tables and its uses. Methods of selecting simple random sample, lottery method, method based on random numbers. Estimates of population total, mean and their variances and standard errors, determination of sample random sampling of attributes.

Unit II

Stratified Random Sampling: stratified random sampling, advantages and Disadvantages of Stratified random sampling, estimation of population mean, and its variance, stratified random sampling with proportional and optimum allocation. Comparison between proportional and optimum allocations with SRSWOR

Systematic Sampling: systematic sampling definition when N=nk and merits and demerits of systematic sampling – estimate of mean and its variance. Comparison of systematic sampling with stratified and SRSWOR

Unit III

Analysis Of Variance: Analysis of variance (ANOVA)-Definition and assumptions One-way with equal and unequal classification, Two way classification.

Design Of Experiments: Definition, Principle of design of experiments, CRD; Layout, advantages and disadvantages and statistical analysis of completely Randomized Design (C.R.D).

Unit IV

Randomized Block Design (R.B.D) and Latin square design (L.S.D) with their layouts and analysis, missing plot technique in R.B.D and L.S.D. Efficiency R.B.D over C.R.D, Efficiency of L.S.D over R.B.D and C.R.D

Unit V

Factorial experiments- Main effects and interaction effects of 2^2 and 2^3 factorial experiments and their analysis. Yates procedure to find factorial effecttotals.

SRI RAMAKRISHNA (AUTONOMOUS) DEGREE COLLEGE
SEMESTER IV :: STATISTICS
MODEL PAPER
Paper –IV :: Sampling Techniques and Design Of Experiments

Time: 3 [Hours]   [Max. Marks: 75]

Part- A

Answer any FIVE questions   **5x5=25 M**

1. Explain SRS with merits & demerits.

2. Explain the methods of selecting a Simple Random Sampling.

3. Explain Stratified random Sampling, give its merits.

4. Explain Systematic Sampling, give its merits & demerits.

5. Explain analysis variance and give its assumptions.

6. What is meant by C.R.D, give its layout with merits & demerits.

7. Explain the method of estimation of missing value in R.B.D.

8. Explain 2^2 – factorial design.

Part-B

Answer All The questions   **5x10=50 M**

9. In SRSWOR, show that sample mean square is an unbiased estimate of population mean square.

OR

Explain the methods of allocation of sample sizes from different strata and also find $V(\bar{y}_{st})$ with these methods.

10. If f.p.c is neglected, Show that V_{opt} V_{prop} V_{ran}.

OR

Explain systematic sampling and also show that $E(\bar{y}_{sys})= \bar{y}_{..}$

11. Explain ANOVA for one way classification.

OR

What meant by R.B.D, give its layout with merits & demerits.

12. Explain the statistical analysis of L.S.D.

OR

Explain Yates procedure for computing factorial effect totals in 2^2 – experiment.

13. Explain the statistical analysis of 2^3-design.

OR

Explain main effects and interaction effects in a 2^2 experiment.

SRI RAMAKRISHNA (AUTONOMOUS) DEGREE COLLEGE

II B.Sc STATISTICS SYLLABUS

Paper V: Applied Statistics

UNIT I

Time Series: Time Series and its components with illustrations, additive, multiplicative models, Trend; Estimation of trend by free hand curve method, method of semi averages. Determination of trend by least squares (Linear trend, parabolic trend only), moving averages method.

UNIT II

Seasonal Component : Determination of seasonal indices by simple averages method, ratio to moving averages, Ratio to trend and Link relative methods, Depersonalization

Unit III

Growth curves: Modified exponential curve, Logistic curve and Grompertz curve, fitting of growth curves by the method of three selected points and partial sums. Detrending Effect of elimination of trend on other components of the time series

Unit IV

Index Numbers: Concept, construction, problems involved in the construction of index numbers, Uses and Limitations. Simple and weighted index numbers. Laspayer's, Paasche's and Fisher's index numbers, Criterion of a good index number, Fisher's ideal index numbers. Cost of living index number and whole sale price index number.

Unit V

Vital Statistics: Introduction, definition and uses of vital statistics, sources of vital statistics. Measures of different Mortality and Fertility rates, Measurement of population growth. Life tables contractions and uses of Life tables

Paper –V :: Applied Statistics

Time: 3 [Hours]   [Max. Marks: 75]

Part- A

Answer any FIVE questions   **5x5=25 M**

1. Explain the mathematical models of a time series.

2. Define time series and give its uses.

3. Explain Deseasonalization?

4. How do you fit a modified exponential curve to a time series data.

5. Explain index numbers and give its uses?

6. Explain the sources of vital statistics?

7. Explain Wholesale price index numbers?

8. Explain the measurement of population growth?

Part-B

Answer All The questions   **5x10=50 M**

9. What are the components of a time series?

                              OR

   Explain least square principle for finding trend values?

10. Explain the method of link relatives?

                              OR

How do you fit a logistic curve and explain the various methods to finding logistic curve?

11. Explain the cost of living index numbers and give its uses?

                              OR

Explain the tests of reversibility and also verify that L, P index numbers satisfies the T.R.T and F.R.T?

12. Construct L, P and F index numbers for the following data?

Commodity	2008		2014	
	Price	Quantity	Price	Quantity
A	15	345	17	350
B	24	1250	28	1400
C	8	820	11	910
D	12	420	13	442
E	36	155	41	185

OR

Explain the various mortality rates with merits and demerits .

13. Explain various fertility rates with merits and demerits?

OR

Define life table and give its component ?

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)

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.