II YEAR IV SEMESTER BSc MPCs SYLLABUS

SRI RAMAKRISHNA DEGREE COLLEGE (AUTONOMOUS)

NANDYAL

PAPER – IV: ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY

Max. Marks: 70

UNIT I Animal Physiology - I
1.1 Process of digestion and assimilation
1.2 Respiration - Pulmonary ventilation, transport of oxygen and CO2
1.3 Circulation - Structure and functioning of heart, Cardiac cycle
1.4 Excretion - Structure and functions of kidney urine formation, counter current Mechanism

UNIT II Animal Physiology - II
2.1 Nerve impulse transmission - Resting membrane potential, origin and propagation of action potentials along myelinated and non-myelinated nerve fibers
2.2 Muscle contraction - Ultra structure of muscle, molecular and chemical basis of muscle contraction
2.3 Endocrine glands - Structure, functions of hormones of pituitary and pancreas

UNIT III Cellular Metabolism – I (Biomolecules)
3.1 Carbohydrates - Classification of carbohydrates. Structure of glucose
3.2 Proteins - Classification of proteins. General properties of amino acids
3.3 Lipids - Classification of lipids

UNIT IV Cellular Metabolism – II
4.1 Carbohydrate Metabolism - Glycolysis, Krebs cycle, Glycogen metabolism, Gluconeogenesis
4.2 Lipid Metabolism – β-oxidation of palmitic acid
4.3 Protein metabolism-Transamination, Deamination and Urea Cycle

Unit – V Embryology
5.1 Gametogenesis
5.2 Fertilization
5.3 Types of eggs
5.4 Types of cleavages

SRI RAMA KRISHNA (AUTONOMOUS) DEGREE COLLEGE ,NANDYAL
ZOOLOGY MODEL PAPER FOR IV SEMESTER
ZOOLOGY - PAPER - IV
ANIMAL PHYSIOLOGY, CELLULAR METABOLISM AND EMBRYOLOGY
Time: 3 hrs   Max. Marks: 70
SECTION-A
Answer any FOUR of the following
Draw labeled diagrams wherever necessary   5x4=20
1. Assimilation
2. Cardiac cycle
3. Counter current Mechanism
4. Action potentials
5. Parathyroid gland
6. Structure of glucose
7. β-oxidation of palmitic acid
8. Types of eggs

SECTION-B
II. Answer any FIVE of the following   5x10=50
   Draw labeled diagrams wherever necessary
9. A) Explain the transport of oxygen and CO_2.
                    OR
   B) Explain the working of heart.
10. A) Explain the origin and propagation of Nerve impulse
                    OR
 B) Describe the Hormonal control of reproduction in a mammal
11. A) Describe the Enzymes Classification and Mechanism of Action
                    OR
 B) Describe the Classification of carbohydrates.
12. A) Write an essay on Carbohydrate Metabolism
                    OR
B) Explain the Protein metabolism.
13. A) Explain the Gametogenesis
                    OR
B) Write an essay on Development of Frog upto formation of primary germ layers.

SRI RAMA KRISHNA (AUTONOMOUS) DEGREE COLLEGE, NANDYAL
ZOOLOGY SYLLABUS FOR SEMESTER - IV
COURSE – 5: IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY

Max. Marks: 70

Unit – I Immunology – I (Overview of Immune system)
1.1 Introduction to basic concepts in Immunology
1.2 Innate and adaptive immunity,
1.3 Cells of immune system
1.4 Organs of immune system

Unit – II Immunology – II (Antigens, Antibodies, MHC and Hypersensitivity)
2.1 Antigens: Basic properties of antigens, B and T cell epitopes, haptens and adjuvants; Factors influencing immunogenicity
2.2 Antibodies: Structure of antibody, Classes and functions of antibodies
2.3 Hypersensitivity – Classification and Types

Unit – III Techniques
3.1 Animal Cell, Tissue and Organ culture media: Natural and Synthetic media,
3.2 Cell cultures: Establishment of cell culture (primary culture, secondary culture, types of cell lines; Protocols for Primary Cell Culture); Organ culture; Cryopreservation of cultures
3.3 Stem cells: Types of stem cells and applications
3.4 Hybridoma Technology: Production & applications of Monoclonal antibodies (mAb)

Unit-IV Applications of Animal Biotechnology
41 Genetic Engineering: Basic concept, Vectors, Restriction Endonucleases and Recombinant DNA technology
4.2 Gene delivery:Microinjection, electroporation, biolistic method (gene gun), liposome and viral-mediated gene delivery
4.3 Manipulation of reproduction in animals: Artificial Insemination, In vitro fertilization, super ovulation, Embryo transfer, Embryo cloning

Unit - V
5.1. PCR:Basics of PCR.
5.2 DNA Sequencing: Sanger's method of DNA sequencing- traditional and automated sequencing
5.3 Fermentation: Different types of Fermentation and Downstream processing; Agriculture

SRI RAMA KRISHNA (AUTONOMOUS) DEGREE COLLEGE, NANDYAL
ZOOLOGY MODEL PAPER FOR V SEMESTER
COURSE – 5: IMMUNOLOGY AND ANIMAL BIOTECHNOLOGY
Time: 3 hrs Max.   Marks: 70

Answer any Four of the following
Draw labeled diagrams wherever necessary   5x4=20
1. Vaccines
2. Basic properties of antigens
3. Structure of antibody
4. Protocols for Primary Cell Culture
5. Monoclonal antibodies
6. Vectors
7. Western blotting techniques
8. Fermentation

II. Answer any FIVE of the following   5x10=50
    Draw labeled diagrams wherever necessary

9. A) Explain the Cells of immune system.
                    OR
 B) Explain the Organs of immune system.
10. A) Explain the Exogenous and Endogenous pathways of antigen presentation and processing
OR
B) Describe the Classification and Types of Hypersensitivity
11. A) Describe the types of stem cells and applications of stem cell
                    OR
B) Describe the Natural and Synthetic culture media.
12.A) Write an essay on Gene delivery any two methods
                    OR
B) Explain the Manipulation of reproduction in animals any two methods
13. A) Explain the DNA fingerprinting Procedure and applications
OR
B) Write an essay on Sanger's method of DNA sequencing traditional and automated
sequencing.

SEMESTER - IV CHEMISTRY SYLLABUS PAPER-IV

 (INORGANIC, ORGANIC AND PHYSICAL CHEMISTRY)   60hrs (4 h / w)

UNIT -I
Organometallic Compounds   classification of organometallic Compounds on the basis of bond type, Concept Definition of hapticity   of organicligands. Metalcarbonyls:18 electron rule, electron count of mononuclear, polynuclear and substituted metalcarbonyls of 3dseries.General methods of preparation of mono and binuclear carbonyls of 3dseries.P-acceptor behaviour of carbon monoxide. Synergic effects (VB approach) - (MOdiagram of CO can be referred to for synergic effect to IRfrequencies) Classification of organometallic Compounds on the basis of bond type.

UNIT – II
Carbohydrates
Occurrence,classificationandtheirbiologicalimportance,Monosaccharides:Constitutionand
absolute configuration of glucose and fructose, epimers and anomers, mutarotation, determination of ring size of glucose and fructose, Haworth projections and conformational structures; Inter conversions of aldoses and ketoses; Killiani-Fischer synthesis and Ruff degradation; Disaccharides– Elementary treatment of maltose,   lactose   and   sucrose. Polysaccharides–Elementary treatment of starch.

UNIT- III Amino acids and proteins
Introduction: Definition of Amino acids, classification of Amino acids into alpha, beta, and gamma amino acids. Natural and essential amino acids - definition and examples, classification of   alpha amino acids into acidic, basic and neutral amino acids with examples. Methods of synthesis: General methods of synthesis of alpha amino acids (specific examples - Glycine, Alanine, valine and leucine) by following methods: a) from halogenated carboxylic acid b) Gabriel Phthalimide synthesis c) strecker's synthesis.

Physical properties: Zwitter ion structure - salt like character - solubility, melting points, amphoteric character, definition of isoelectric point.

Chemical properties: General reactions due to amino and carboxyl groups - lactams from gamma and   delta amino acids by heating- peptide bond (amide linkage). Structure and nomenclature of peptides and   protein of maltose, lactose and sucrose. Polysaccharides–Elementary treatment of starch.

UNIT -IV   Heterocyclic Compomunds
Introduction and definition: Simple five membered ring compounds with one hetero atom
Ex. Furan. Thiophene and pyrrole - Aromatic character – Preparation from 1, 4, -dicarbonyl compounds: Acidic character of pyrrole - electrophillic substitution at 2 or 5 position, Halogenation, Nitration and Sulphonation under mild conditions - Diels Alder reaction in furan.

Pyridine – Structure - Basicity - Aromaticity- Comparison pyrrole- one method of preparation and properties - Reactivity towards Nucleophilic substitution with reaction.

Nitrogen Containing Functional Groups
Nitrohydrocarbons   3h
Nomenclature and classification-nitro hydrocarbons, structure Properties-Tautomerism of nitroalkanes leading to aci and keto form, Preparation of Nitroalkanes, reactivity -halogenation, reaction with HONO (Nitrous acid), Nef reaction

Amines: 11h
Introduction, classification, importance and general methods of preparation.
Properties : Physical properties, Basicity of amines: Effect of substituent, solvent and steric effects. Distinction between Primary, secondary and tertiary aminesusingHinsberg's method and nitrousacid.
Discussion of thefollowing reactions with emphasis on the mechanistic pathway: Gabriel Phthalimide synthesis, Hoffmann-Bromamidereaction, Carbyl amine reaction, Mannich reaction, Hoffmann's exhaustive   methylation, Hofmann- elimination reaction and Cope elimination.
Diazonium Salts: Preparation and synthetic applications of diazonium salts preparation of arenes, haloarenes, phenols, cyano and nitro compounds. Coupling reactions of diazonium salts (preparation of azo dyes).

UNIT- V   Photochemistry
Difference between thermal and photochemical processes, Laws of photochemistry- Grothus-
Draper's law and Stark-Einstein's law of photochemical equivalence, Quantum yield-Photochemical   reaction mechanism- hydrogen- chlorine and hydrogen- bromide reaction. Qualitative description of fluorescence, phosphorescence, Jablonski diagram, Photosensitized reactions-energy transfer processes (simple example)

Thermodynamics
The first law of thermodynamics-statement, definition of internal energy and enthalpy, Heat capacities and their relationship, Joule-Thomson effect- coefficient, Calculation of work for the expansion of perfect gas under isothermal and adiabatic conditions for reversible its efficiency, Carnot theorem, Concept of entropy, entropy as a state function, entropy changes in reversible and irreversible processes. Entropy changes in spontaneous and equilibrium processes. energies-Criteria Third law of thermodynamics Spontaneous and non- spontaneous processes, Helmholtz and Gibbs equation for spontaneity.

SRI RAMAKRISHNA DEGREE (AUTONOMOUS) COLLEGE,NANDYAL
MODEL PAPER
SECOND YEAR B.Sc., DEGREE EXAMINATION SEMESTER-IV
CHEMISTRY COURSE -IV: INORGANIC, ORGANIC PHYSICAL CHEMISTRY
Time: 3 hours   Maximum Marks: 70

PART-A
Answer any FOUR of the following questions. Each carries FIVE marks 4 X 5= 20M
1. Describe the 18 electron rule of mono nuclear and polynuclear metal carbonyls
with suitable examples.
2. What are epimers and anomers. Give examples.
3. Discuss about iso electric point and zwitter ion.
4. Discuss the Paul-Knorr synthesis of five membered heterocyclic compounds.
5. Explain Tautomerism shown by nitro alkanes
6. Discuss the basic nature of amines.
7. Write the differences between thermal and photochemical reactions.
8. Derive heat capacities and derive $C_p - C_v = R$

PART- B
Answer ALL the questions. Each carries TEN marks   5 X 10 = 50M
9 (a). What are organometallic compounds? Discuss their Classification on the basis of type of
bonds with examples.

(or)
(b). Discuss the general methods of preparations of mono bi-nuclear carbonyls of 3d series.
10 (a). Discuss the constitution, configuration and ring size of glucose. Draw the Haworth and
Conformational structure of glucose.

(or)
(b). (i) Explain Ruff's degradation.
    (ii) Explain Kiliani- Fischer synthesis.
11.(a). What are amino acids? Write any three general methods of preparation of amino acids.

(or)
(b). Discuss the aromatic character of Furan, Thiophene and Pyrrole
12.(a). Write the mechanism for the following.
    (i) Nef reaction
    (ii) Mannich reaction

(or)
(b).(i) Explain Hinsberg separation of amines.
    (ii) Discuss any three synthetic applications of diazonium salts.
13.(a). What is quantum yield? Explain the photochemical combination of Hydrogen- Chlorine
and Hydrogen - Bromine.

(or)
    (b). Define entropy. Describe entropy changes in the reversible and irreversible process.
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INORGANIC CHEMISTRY
UNIT –I2 h
Coordination Chemistry 12 h

IUPAC nomenclature of coordination compounds, Structural and stereoisomerism in complexes with coordination numbers 4 and 6. Valence Bond Theory (VBT): Inner and outer orbital complexes. Limitations of VBT, Crystal field effect, octahedral symmetry. Crystal field stabilization energy (CFSE), Crystal field effects for weak and strong fields. Tetrahedral symmetry, Factors affecting the magnitude of crystal field splitting energy, Spectrochemical series, Comparison of CFSE for Octahedral and Tetrahedral complexes, Tetragonal distortion of octahedral geometry.Applications of crystal field theory.

UNIT –II

1. InorganicReactionMechanism: **4h**

Introduction to inorganic reaction mechanisms.Concept of reaction pathways, transitionstate, intermediate and activated complex. Labile and inert complexes, ligand substitution reactions - SN^1 and SN^2,Substitutionreactions in square planar complexes, Trans-effect, the ories of trans effect and its applications

2. Stability   ofmetal complexes: **2h**

Thermodynamic stability and kinetic stability, factors affecting the stability of metal complexes, chelate effect, determination of composition of complex by Job's method and mole ratio method.

BioinorganicChemistry:8h

Metalions present inbiological systems, classification of elements according to their action in biological system.

Excess and deficiency of sometracemetals.Toxicityofmetalions(Hg,Pb,CdandAs), reasons fortoxicity, Use of chelatingagentsinmedicine, Cisplatinasananti-cancerdrug. Iron and its application in bio-systems, Haemoglobin, Myoglobin.Storage and transfer of iron.

PHYSICALCHEMISTRY   **34 h**
UNIT-III

1 .Phase rule

Explanation of the terms phase, component and degrees of freedom. Thermodynamic derivation of Gibbs phase rule. Phase diagram of one component system - water system, Study of Phase diagrams of Simple eutectic systems i) Pb-Ag system, desilverisation of lead ii) NaCl-Water system .

UNIT-IV

Electrochemistry 14h

Specific conductance, equivalent conductance and molar conductance- Definition and effect of dilution. Cell constant. Strong and weak electrolytes, Kohlrausch's law and its applications, Definition of transport number, determination of transport number by Hittorf's method. Debye-Huckel- Onsager's equation for strong electrolytes (elementary treatment only), Application of conductivity measurements- conduct metric titrations.

Electrochemical Cells- Single electrode potential, Types of electrodes with examples: Metal-metal ion, Gas electrode, Inert electrode, Redox electrode, Metal-metal insoluble salt- salt anion. Determination of EMF of a cell, Nernst equation, Applications of EMF measurements - Potentiometric titrations. Fuel cells- Basic concepts, examples and applications

UNIT-V

Chemical Kinetics: **14h**

The concept of reaction rates. Effect of temperature, pressure, catalyst and other factors on reaction rates. Order and molecularity of a reaction, Derivation of integrated rate equations for zero, first and second order reactions (both for equal concentrations of reactants). Half–life of a reaction. General methods for determination of order of a reaction.Concept of activation energy and its calculation from Arrhenius equation. Theories of Reaction Rates: Collision theory and Activated Complex theory of bimolecular reactions. (Qualitativetreatmentonly). Enzymecatalysis-Specificity, factors affecting enzyme catalysis, Inhibitors and Lock & key model. Michaels- Menten equation- derivation, significance of Michaelis-Menten constant.

SRI RAMAKRISHNA DEGREE (AUTONOMOUS) COLLEGE,NANDYAL
MODEL PAPER
SECOND YEAR B.Sc., DEGREE EXAMINATION
SEMESTER-IV
CHEMISTRY COURSE V: INORGANIC PHYSICAL CHEMISTRY
Time: 3 hours   **Maximum Marks:70**
PART- A
Answer any FOUR of the following questions. Each carries FIVE marks   4 X 5 = 20M
1. Write note on Jahn-Teller distortion.
2. Explain Labile; inert complexes.
3. Explain Job's method for determination of composition of complex.
4. Explain Thermodynamic derivation of Gibb's phase rule.
5. Explain any two conductometric titrations.
6. Write note on Fuel Cells with examples and applications.
7. What is enzyme catalysis? Write any three factors effecting enzyme catalysis.
8. Derive Michaels- Menten equation.

PART- B
Answer ALL the questions. Each carries TEN marks   5 X 10 = 50M
9 (a). Explain Valence Bond theory with Inner and Outer orbital complexes. Write limitations of VBT.
(or)
(b). Define CFSE. Explain the factors effecting the magnitude of crystal field splitting energy.
10 (a). Explain Trans effect. Explain the theories of trans effect and write any two applications of trans effect.
(or)
(b). (i) Write the biological functions of Haemoglobin and Myoglobin.
    (ii) Write note on use of chelating agents in medicines
11.(a). Define Phase rule and terms involved in it. Explain phase diagram of Pb-Ag system.
(or)
(b). (i) Explain phase diagram for NaCl-water system.
(ii) Explain briefly about Freezing mixtures.
12.(a). Define Transport number. Write experimental method for the determination of transport number by Hittorf method
(or)
(b).(i) Define single electrode potential.
    (ii) Explain four types of electrodes with examples.
13.(a). Explain general methods for determination of order of a reaction.
(or)
   (b).Explain Collision theory and Activated complex theory of bimolecular reactions.
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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 ʻthisʼ, Instance Methods, Passing Primitive Data Types to Methods, Passing Objects to Methods, Passing Arrays to Methods, Recursion, Factory Methods
Inheritance: Inheritance, The keyword ʻsuperʼ, 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

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.