SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE
(AUTONOMOUS)
(Affiliated to JNTUK, Kakinada), (Recognized by AICTE, New Delhi)
UG Programmes CE,CSE,ECE,EEE,IT & ME are Accredited by NBA
CHINNA AMIRAM (P.O):: BHIMAVARAM :: W.G.Dt., A.P., INDIA :: PIN: 534 204
Estd:1980

Regulation: R20									
INFORMATION TECHNOLOGY (Minors)									
SCHEME OF INSTRUCTION & EXAMINATION (With effect from 2020-21 admitted Batch onwards)									
Course Code	**Course Name**	**Year/ Sem**	**Cr**	**L**	**T**	**P**	**Int. Marks**	**Ext. Marks**	**Total Marks**
B20ITM101	Data Structures and Algorithms	II-II	4	3	1	0	30	70	100
B20ITM201	Object Oriented Programming using C++	III-I	4	3	1	0	30	70	100
B20ITM301	Operating Systems	III-II	4	3	1	0	30	70	100
B20ITM401	Software Engineering	IV-I	4	3	1	0	30	70	100
B20ITM501	*MOOCS-I	II-II to IV-II	2	--	--	--	--	--	100
B20ITM601	*MOOCS-II	II-II to IV-II	2	--	--	--	--	--	100
		TOTAL	**20**	**12**	**3**	**2**	**120**	**280**	**600**

*Two MOOCS courses of any INFORMATION TECHNOLOGY related Program Core Courses from NPTEL/SWAYAM with a minimum duration of 8 weeks (2 Credits) courses other than the courses offered need to be taken by prior information to the concern. These courses should be completed between II Year II Semester to IV Year II Semester

Course Code	Category	L	T	P	C	I.M	E.M	Exam
B20ITM101	**Minors**	**3**	**1**	**--**	**4**	**30**	**70**	**3 Hrs.**

DATA STRUCTURES & ALGORITHMS

(Minor Degree course in IT)

(Offered to CE, ECE, EEE & ME)

Course Objectives:

1.	Introduce the fundamental concept of data structures and abstract data types
2.	Emphasize the importance of data structures in developing and implementing efficient algorithms
3.	Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms

Course Outcomes: By the end of the course, students will be able to

S.No	Outcome	Knowledge Level
1.	Implement & analyze various searching &sorting algorithms.	K3
2.	Able to implement data structures like stacks, queues using arrays.	K3
3.	Implement & perform operations on dynamic linear data structures like linked lists.	K3
4.	Implement various data structure into applications such as trees, AVL trees.	K3
5.	Apply graph algorithms for given data.	K3

SYLLABUS

UNIT-I (10 Hrs)	**Data Structures -** Definition, Classification of Data Structures, Operations on Data Structures, Abstract Data Type (ADT), Preliminaries of algorithms. Time and Space complexity, Asymptotic Notations **Searching** - Linear search, Binary search, Interpolation Search, Fibonacci search and time complexities **Sorting**- Insertion sort, Selection sort, Exchange (Bubble sort, quick sort), distribution (radix sort), merging (Merge sort) algorithms and time complexities.
UNIT-II (10 Hrs)	**Stacks:** Introduction to Stacks, Array Representation of Stacks, Operations on Stacks, Applications-Reversing list, Factorial Calculation, Infix to Postfix Conversion, Evaluating Postfix Expressions. **Queues:** Introduction to Queues, Representation of Queues-using Arrays, Implementation of Queues-using Arrays, Application of Queues-Circular Queues, Dequeues, Priority Queues, Multiple Queues.

UNIT-III (10 Hrs)	**Linked Lists:** Introduction, Single linked list, Representation of Linked list in memory, Operations on Single Linked list-Insertion, Deletion, Search and Traversal, Reversing Single Linked list, Applications on Single Linked list- Implementation of Stack and Queues, Polynomial Expression Representation, Addition and Multiplication, Sparse Matrix Representation using Linked List, Advantages and Disadvantages of Single Linked list, Double Linked list-Insertion, Deletion, Circular Linked list-Insertion, Deletion.
UNIT-IV (8 Hrs)	**Trees:** Basic Terminology in Trees, Binary Trees-Properties, Representation of Binary Trees using Arrays and Linked lists. Binary Search Trees- Basic Concepts, BST Operations: Insertion, Deletion, Tree Traversals, Applications-Expression Trees, Heap Sort, Balanced Binary Trees- AVL Trees, Insertion, Deletion and Rotations.
UNIT-V (12 Hrs)	**Graphs:** Basic Concepts, Representations of Graphs-Adjacency Matrix and using Linked list, Graph Traversals (BFT & DFT), Applications- Minimum Spanning Tree Using Prims & Kruskals Algorithm, Dijkstra's shortest path, Transitive closure, Warshall's Algorithm.

Text Books:	
1.	Data Structures Using C. 2nd Edition.ReemaThareja, Oxford.
2.	Data Structures and algorithm analysis in C, 2nded, Mark Allen Weiss.
Reference Books:	
1.	Fundamentals of Data Structures in C, 2nd Edition, Horowitz, Sahni, Universities Press.
2.	Data Structures: A PseudoCode Approach, 2/e, Richard F.Gilberg, Behrouz A. Forouzon, Cengage.
3.	Data Structures with C, Seymour Lipschutz TMH

		Course Code: B20ITM101			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R20**
		II B.Tech. II Semester MODEL QUESTION PAPER			
		DATA STRUCTURES & ALGORITHMS			
		(Minor Degree Course in IT for CE, ECE, EEE & ME)			
Time: 3 Hrs.					**Max. Marks:70**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
			CO	**KL**	**M**
		UNIT-I			
1	**a)**	Define data structure. Discuss different types of data structures their applications.	**1**	**2**	**7**
	b)	Explain the recursive merge sort algorithm to sort the following elements: 12, 25, 5, 9, 1, 84, 63, 7, 15, 4, 3.	**1**	**3**	**7**
		OR			
2	**a)**	Write Recursive Binary Search algorithm. Search element 12 in the given list using Recursive Binary Search algorithm 2, 5, 12, 15, 23, 28, 36, 39, 45	**1**	**3**	**7**
	b)	Rearrange following numbers using quick sort: 10, 6, 3, 7, 17, 26, 56, 32, 72	**1**	**3**	**7**
		UNIT-II			
3	**a)**	Explain the procedure to evaluate postfix expression. Evaluate the following postfix expression 7 3 4 + - 2 4 5 / + * 6 / 7 +	**2**	**2**	**7**
	b)	Discuss the algorithms for enQueue and deQueue operations on a Circular Queue Using Arrays	**2**	**2**	**7**
		OR			
4	**a)**	Give the structure of Queue ADT. Explain the operations in Queue Using Arrays	**2**	**2**	**7**
	b)	Convert the given infix expression A+B^C+(D*E/F)*G into its postfix expression, and evaluate the same using stack. Here A=3, B=5, C=2, D=7, E=4, F=1, G=8.	**2**	**3**	**7**
		UNIT-III			
5	**a)**	Write an algorithm for representing the polynomial $6x^6 + 4x^3 - 2x + 10$ using linked lists.	**3**	**3**	**7**
	b)	Write an algorithm to insert new node at the beginning, at middle position and at the end of a singly linked list.	**3**	**3**	**7**
		OR			

6	**a)**	Write an algorithm to push and pop an element from linked stack	**3**	**3**	**7**
	b)	Write an algorithm to delete an element anywhere from doubly linked list.	**3**	**3**	**7**
		UNIT-IV			
7	**a)**	Explain Heap sort algorithm. Create Heap for the following elements and then sort them. (13, 102, 405, 136, 15, 105, 390, 432, 28, 444)	**4**	**3**	**7**
	b)	Develop a binary search tree resulting after inserting the following integer keys 49, 27, 12, 11, 33, 77, 26, 56, 23, 6. (i) Check whether the tree is almost complete or not? (ii) Determine the height of the tree (iii) Write post order and pre-order traversals	**4**	**3**	**7**
		OR			
8	**a)**	How to represent binary tree using arrays and linked list?	**4**	**2**	**7**
	b)	**Construc**t an AVL tree by inserting the following elements successively C O M P U T E R	**4**	**3**	**7**
		UNIT-V			
9	**a)**	Explain Warshall's algorithm to find transitive closure of a graph with a suitable example.	**5**	**2**	**7**
	b)	What is minimum cost spanning Tree? Explain the process of finding the minimum spanning tree with suitable example.	**5**	**2**	**7**
		OR			
10	**a)**	Explain Depth First Search algorithms in detail.	**5**	**2**	**7**
	b)	Explain Dijkstra's algorithm with suitable example.	**5**	**2**	**7**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 14 marks

Course Code	Category	L	T	P	C	I.M	E.M	Exam
B20ITM201	Minor	3	1	--	4	30	70	3Hrs

OBJECT ORIENTED PROGRAMMING THROUGH C++

(Minor Degree course in IT)

(Offered to CE, ECE, EEE & ME)

Course Objectives:

1.	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects
2.	Understand dynamic memory management techniques using pointers, constructors, destructors
3.	Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
4.	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming
5.	Demonstrate the use of various OOPs concepts with the help of programs

Course Outcomes: By the end of the course, students will be able to

S.No	Outcome	Knowledge Level
1.	Classify object oriented programming and procedural programming	K2
2.	Apply C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling	K3
3.	Build C++ classes using appropriate encapsulation and design principles	K4
4.	Apply object oriented or non-object-oriented techniques to solve bigger computing problems	K3

SYLLABUS

UNIT-I (8Hrs)	Introduction to C++: Difference between C and C++, Evolution of C++, The Object-Oriented Technology, Disadvantage of Conventional Programming, Key Concepts of Object Oriented Programming, Advantage of OOP, Object Oriented Language.
UNIT-II (10Hrs)	Classes and Objects &Constructors and Destructor: Classes in C++, Declaring Objects, Access Specifiers and their Scope, Defining Member Function, Overloading Member Function, Nested class, Constructors and Destructors, Introduction, Constructors and Destructor, Characteristics of Constructor and Destructor, Application with Constructor, Constructor with Arguments parameterized Constructor, Destructors, Anonymous Objects.
UNIT-III	Operator Overloading and Type Conversion & Inheritance: The Keyword Operator,

(12Hrs)	Overloading Unary Operator, Operator Return Type, Overloading Assignment Operator (=), Rules for Overloading Operators, Inheritance, Reusability, Types of Inheritance, Virtual Base Classes- Object as a Class Member, Abstract Classes, Advantages of Inheritance, Disadvantages of Inheritance.
UNIT-IV (10Hrs)	Pointers & Binding Polymorphisms and Virtual Functions: Pointer, Features of Pointers, Pointer Declaration, Pointer to Class, Pointer Object, The this Pointer, Pointer to Derived Classes and Base Class, Binding Polymorphisms and Virtual Functions, Introduction, Binding in C++, Virtual Functions, Rules for Virtual Function, Virtual Destructor.
UNIT-V (10Hrs)	Generic Programming with Templates & Exception Handling: Definition of class Templates, Normal Function Templates, Over Loading of Template Function, Bubble Sort Using Function Templates, Difference between Templates and Macros, Linked Lists with Templates, Exception Handling, Principles of Exception Handling, The Keywords try throw and catch, Multiple Catch Statements, Specifying Exceptions.

Textbooks:	
1.	A First Book of C++, Gary Bronson, Cengage Learning.
2.	The Complete Reference C++, Herbert Schildt, TMH.
3.	Programming in C++, Ashok N Kamthane, Pearson 2nd Edition
Reference Books:	
1.	Object Oriented Programming C++, Joyce Farrell, Cengage
2.	C++ Programming: from problem analysis to program design, DS Malik,Cengage Learning
e-Resources	
1.	https://nptel.ac.in/courses/106/105/106105151/
2.	https://github.com/topics/object-oriented-programming

			Course Code: B20ITM201		
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R20**
III B.Tech. I Semester MODEL QUESTION PAPER					
OBJECT ORIENTED PROGRAMMING THROUGH C++					
(Minor Degree Course in IT for CE, ECE, EEE & ME)					
Time: 3 Hrs.					**Max. Marks: 70 M**
Answer **ONE Question** from **EACH UNIT**					
All questions carry equal marks					
Assume suitable data if necessary					
			CO	**KL**	**M**
		UNIT-I			
1.	**a)**	Explain the key concepts of Object-oriented programming.	**1**	**2**	**7**
	b)	Briefly write about the evolution of C++.	**1**	**2**	**7**
		OR			
2.	**a)**	Differentiate between C and C++.	**1**	**2**	**7**
	b)	Discuss advantages of OOP.	**1**	**2**	**7**
		UNIT-II			
3.	**a).**	What is an object? How it is different from an ordinary variable and a class?	**2**	**2**	**7**
	b).	Explain Nested class with example code.	**2**	**2**	**7**
		OR			
4.	**a).**	Explain about default and parameterized constructors with suitable examples	**2**	**2**	**7**
	b).	Discuss characteristics of destructor	**2**	**2**	**7**
		UNIT-III			
5.	**a).**	What is operator overloading? Write rules for overload an operator.	**2**	**2**	**7**
	b).	Discuss over loading unary operator	**2**	**2**	**7**
		OR			
6.	**a).**	What is inheritance? present the advantages and disadvantages inheritance	**3**	**2**	**7**
	b).	What are different types of inheritance supported by C++? Give an example for each.	**3**	**2**	**7**
		UNIT-IV			
7.	**a).**	What is pointer and discuss features of pointers	**3**	**2**	**7**
	b).	Explain about different Binding and Polymorphisms	**3**	**2**	**7**

		OR			
8.	**a).**	Write a C++ program to demonstrate pointers to base and derived classes**.**	**3**	**3**	**7**
	b).	Discuss about virtual functions in C++ example	**3**	**2**	**7**
		UNIT-V			
9.	**a).**	Explain the concepts of Class Template with overloaded operators.	**4**	**2**	**7**
	b).	Write a C++ program that implements Bubble Sort using function templates	**4**	**3**	**7**
		OR			
10.	**a).**	Explain linked list with templates	**4**	**2**	**7**
	b).	Discuss the principles of exception handling	**4**	**2**	**7**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 14 marks

Course Code	Category	L	T	P	C	I.M	E.M	Exam
B20ITM301	Minor	3	1	--	4	30	70	3Hrs

OPERATING SYSTEMS

(Minor Degree course in IT)

(Offered to CE, ECE, EEE & ME)

Course Objectives:

1	Introduce to the internal operation of modern operating systems
2	Define, explain, processes and threads, mutual exclusion, CPU scheduling, deadlock, memory management, and file systems
3	Understand File Systems in Operating System like UNIX/Linux and Windows
4	Understand Input Output Management and use of Device Driver and Secondary Storage (Disk) Mechanism
5	Analyze Security and Protection Mechanism in Operating System

Course Outcomes: By the end of the course, students will be able to

S.No	Outcome	Knowledge Level
1	Describe various generations of Operating System and functions of Operating System	K2
2	Describe the concept of program, process and thread and analyze various CPU Scheduling Algorithms and compare their performance	K3
3	Solve Inter Process Communication problems using Mathematical Equationsby various methods	K3
4	Compare various Memory Management Schemes especially paging and Segmentation in Operating System and apply various Page Replacement Techniques	K3
5	Outline File Systems in Operating System like UNIX/Linux and Windows	K2

SYLLABUS

UNIT-I (10 Hrs)	**Operating Systems Overview:** Operating system functions, Operating system structure, Operating systems operations, Computing environments, Open-Source Operating Systems. **System Structures:** User and Operating-System Interface, systems calls, Types of System Calls, system programs, operating system structure.

UNIT-II (10 Hrs)	**Process Concept:** Process scheduling, Operations on processes, Inter-process communication, Communication in client server systems. **Multithreaded Programming:** Multithreading models, Process Scheduling: Basic concepts, Scheduling criteria, Scheduling algorithms, Multiple processor scheduling, Thread scheduling. **Inter-process Communication:** Race conditions, Critical Regions, Mutual exclusion with busy waiting, Sleep and wakeup, Semaphores, Mutexes, Monitors, Message passing. Classical IPC Problems - Dining philosophers problem, Readers and writers problem.
UNIT-III (10 Hrs)	**Memory-Management Strategies:** Introduction, Swapping, Contiguous memory allocation, Paging, Segmentation. **Virtual Memory Management:** Introduction, Demand paging, Copy on-write, Page replacement, Frame allocation, Thrashing.
UNIT-IV (10 Hrs)	**Deadlocks:** Resources, Conditions for resource deadlocks, Deadlock detection and recovery, Deadlock avoidance, Deadlock prevention. **File Systems:** Files, Directories, File system implementation, management and optimization. Secondary-Storage Structure: Overview of disk structure, and attachment, Disk scheduling, RAID structure.
UNIT-V (10 Hrs)	**System Protection:** Goals of protection, Principles and domain of protection, Access matrix, Access control, Revocation of access rights.
Text Books:	
1.	Silberschatz A, Galvin P B, and Gagne G, Operating System Concepts, 9th edition, Wiley, 2013.
2.	Tanenbaum A S, Modern Operating Systems, 3rd edition, Pearson Education, 2008. (for Interprocess Communication and File systems.)
Reference Books:	
1.	Dhamdhere D M, Operating Systems A Concept Based Approach, 3rd edition, Tata McGraw-Hill, 2012.
2.	Stallings W, Operating Systems -Internals and Design Principles, 6th edition, Pearson Education,2009
3.	Nutt G, Operating Systems, 3rd edition, Pearson Education, 2004.
e-Resources	
1.	https://nptel.ac.in/courses/106/105/106105214/

		Course Code: B20ITM301			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R20**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		OPERATING SYSTEMS			
		(Minor Degree Course in IT for CE, ECE, EEE & ME)			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
			CO	**KL**	**M**
		UNIT-I			
1.	**a).**	Discuss the services provided by the operating system for efficient system operation.	**1**	**2**	**7**
	b).	What is a System call? Explain in detail the system call sequence to copy the contents of one file to another file.	**1**	**2**	**7**
		OR			
2.	**a).**	Discuss the different types of Operating Systems.	**1**	**2**	**7**
	b).	Explain the purpose of system calls and discuss the system calls related to process control and communication in brief.	**1**	**2**	**7**
		UNIT-II			
3.	**a).**	List the advantages of inter-process communication? How communication takes place in a shared-memory environment? Explain.	**2**	**3**	**7**
	b).	Assume the following workload in a system: Process Arrival Time Burst Time P1 5 5 P2 4 6 P3 3 7 P4 1 9 P5 2 2 P6 6 3 Draw a Gantt chart illustrating the execution of these jobs using Round robin scheduling algorithm with time slice = 3 and also Calculate the average waiting time and average turnaround time.	**2**	**3**	**7**
		OR			
4.	**a).**	What is a scheduler? List and describe different types of schedulers.	**2**	**2**	**7**
	b).	What is Multi threading? Explain different types of Multi threading Models?	**2**	**2**	**7**
		UNIT-III			
5.	**a).**	Given free memory partitions of 100 K, 500 K, 200 K, 300 K, and 600	**3**	**3**	**7**

		K (in order), how would each of the First-fit, Best-fit, and Worst-fit algorithms place processes of 212 K, 417 K, 112 K, and 426 K (in order)?			
	b).	Define Virtual Memory. Explain the process of converting virtual addresses to physical addresses with a neat diagram.	**3**	**2**	**7**
		OR			
6.	**a).**	Explain various types of memory Allocation techniques with advantages and disadvantages with example	**3**	**2**	**7**
	b).	Consider the following page reference string 1, 2,3,4,5,2,6,7,3,2,4,1,7,1,4,3,2,3,4,7,1. Compare the number of page faults with frame sizes 3,4 and 5 with any replacement algorithm.	**3**	**3**	**7**
		UNIT-IV			
7.	**a).**	What is Dead lock? Explain deadlock prevention strategies?	**4**	**2**	**7**
	b).	Explain the banker's algorithm with a suitable example.	**4**	**2**	**7**
		OR			
8.	**a).**	Discuss the different file allocation methods with suitable example.	**4**	**2**	**7**
	b).	Describe any two disk scheduling algorithms with suitable illustrations.	**4**		**7**
		UNIT-V			
9.	**a).**	Explain Goals and Principles of protection	**5**	**2**	**7**
	b).	Describe the access matrix model used for protection purpose.	**5**	**2**	**7**
		OR			
10.	**a).**	Write a short note on Revocation of access rights.	**5**	**2**	**7**
	b).	What is the Access Matrix? Explain copy, owner and control rights with example access matrix.	**5**	**2**	**7**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 14 marks

Course Code	Category	L	T	P	C	I.M	E.M	Exam
B20ITM401	Minor	3	1	--	4	30	70	3Hrs

SOFTWARE ENGINEERING

(Minor Degree course in IT)

(Offered to CE, ECE, EEE & ME)

Course Objectives:

1	The aim of the course is to provide an understanding of the working knowledge of the techniques for estimation, design, testing and quality management of large software development projects.
2	Topics include process models, software requirements, software design, software testing, software process/product metrics, risk management, quality management and UML diagrams

Course Outcomes: By the end of the course, students will be able to

S.No	Outcome	Knowledge Level
1	Decompose the given project in various phases of a lifecycle and choose appropriate process model depending on the user requirements.	K3
2	perform various life cycle activities like Analysis, Design, Implementation, Testing and Maintenance	K4
3	Apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.	K3
4	Will have experience and/or awareness of testing problems and will be able to develop a simple testing report.	K3

SYLLABUS

UNIT-I (8 Hrs)	**Introduction to Software Engineering:** The evolving role of software, changing nature of software, software myths. **A Generic view of process:** Software engineering- a layered technology, a process framework, the capability maturity model integration (CMMI), process patterns, process assessment, personal and team process models. **Process models:** The waterfall model, incremental process models, evolutionary process models, the unified process.
UNIT-II (10 Hrs)	**Software Requirements**: Functional and non-functional requirements, user requirements, system requirements, interface specification, the software requirements document. **Requirements engineering process:** Feasibility studies, requirements elicitation and analysis, requirements validation, requirements management. **System models:** Context models, behavioral models, data models, object models,

	structured methods.
UNIT-III (12 Hrs)	**Design Engineering**: Design process and design quality, design concepts, the design model. **Creating an architectural design:** software architecture, data design, architectural styles and patterns, architectural design, conceptual model of UML, basic structural modeling, class diagrams, sequence diagrams, collaboration diagrams, use case diagrams, component diagrams.
UNIT-IV (8 Hrs)	**Testing Strategies:** A strategic approach to software testing, test strategies for conventional software, black-box and white-box testing, validation testing, system testing, the art of debugging.
UNIT-V (12 Hrs)	**Metrics for Process and Products:** Software measurement, metrics for software quality. **Product metrics:** Software quality, metrics for analysis model, metrics for design model, metrics for source code, metrics for testing, metrics for maintenance. **Quality Management:** Quality concepts, software quality assurance, software reviews, formal technical reviews, statistical software quality assurance, software reliability, the ISO 9000 quality standards.
Text Books:	
1.	Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition, Mc Graw Hill International Edition.
2.	Software Engineering- Sommerville, 7th edition, Pearson Education.
3.	The unified modeling language user guide Grady Booch, James Rambaugh, Ivar Jacobson, Pearson Education.
Reference Books:	
1.	Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiley.
2.	Software Engineering principles and practice- Waman S Jawadekar, The Mc Graw-Hill Companies.
3.	Fundamentals of object-oriented design using UML Meiler page-Jones: Pearson Education.

		Course Code: B20ITM401			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R20**
		IV B.Tech. I Semester MODEL QUESTION PAPER			
		SOFTWARE ENGINEERING			
		(Minor Degree Course in IT for CE, ECE, EEE & ME)			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer **ONE Question** from **EACH UNIT**			
		All questions carry equal marks			
		Assume suitable data if necessary			
			CO	**KL**	**M**
		UNIT-I			
1.	**a)**	Explain waterfall model with neat diagram.	**1**	**2**	**7**
	b)	Illustrate unified process.	**1**	**3**	**7**
		OR			
2.	**a)**	Categorize process assessment and improvement.	**1**	**3**	**7**
	b)	Explain software myths.	**1**	**2**	**7**
		UNIT-II			
3.	**a)**	Interpret functional requirements with examples.	**2**	**3**	**7**
	b)	Differentiate user requirements and system requirements.	**2**	**3**	**7**
		OR			
4.	**a)**	Classify the characteristics of context model, behavioral model and data model.	**2**	**3**	**7**
	b)	Interpret Software Requirements document.	**2**	**3**	**7**
		UNIT-III			
5.	**a)**	Identify the relationships in class diagram for **"Airlines Reservation System".**	**3**	**3**	**7**
	b)	Design interaction diagrams for "**Online Book Sales With Mobile SMS". (Any 2)**	**3**	**3**	**7**
		OR			
6.	**a)**	Design the complete usecase model for the following system "**Hospital management system".**	**3**	**3**	**7**
	b)	Explain about architectural styles.	**3**	**2**	**7**
		UNIT-IV			
7.	**a)**	Explain about white box testing with examples.	**4**	**2**	**7**

	b)	Interpret black box testing with examples.	**4**	**3**	**7**
		OR			
8.	**a)**	Interpret "A strategic approach to software testing".	**4**	**3**	**7**
	b)	Illustrate unit testing with examples.	**4**	**3**	**7**
		UNIT-V			
9.	**a)**	Interpret software quality assurance.	**4**	**3**	**7**
	b)	Explain metrics for design model.	**4**	**2**	**7**
		OR			
10.	**a)**	Interpret metrics for testing, metrics for maintenance.	**4**	**3**	**7**
	b)	Categorize ISO 9000 quality standards.	**4**	**3**	**7**

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 14 marks