SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE(A)
II B. Tech I Semester (R19)
DISCRETE MATHEMATICAL STRUCTURES
Information Technology
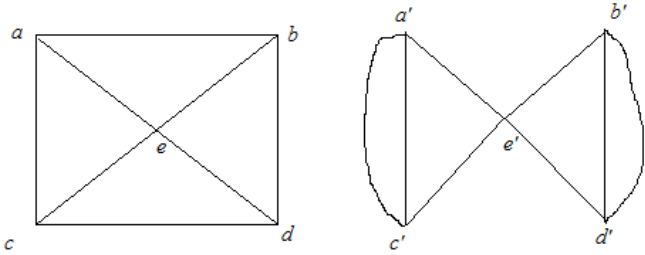**MODEL QUESTION PAPER**

TIME : 3 Hrs.   **Max. Marks : 75 M**

Answer **ALL Questions.** All questions carry equal marks.
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Q.No.	Questions	CO	KL	M
1.a)	Prove that $\{((p \vee q) \to r) \wedge (\neg p)\} \to (q \to r)$ is a tautology	CO1	K2	7
b)	Verify that the following argument is valid by using the rules of inference If Clifton does not live in France, then he does not speak French. Clifton does not drive a Datsun If Clifton lives in France, then he rides a bicycle Either Clifton speaks French, or he drives a Datsun Hence, Clifton rides a bicycle	CO1	K2	8
(OR)				
2.a)	Verify that the following argument is valid by using the rules of inference, quantifiers. Babies are illogical. Nobody is despised who can manage a crocodile. Illogical people are despised. Hence, babies cannot manage crocodiles.	CO1	K2	8
b)	Determine the PDNF and PCNF of $p \vee \neg q$	CO1	K2	7
3.a)	Determine the number of ways of arranging 6 boys and 6 girls in a row. In how many of these arrangements i) All girls will be together ii) No two girls will be together iii) Boys and girls come alternatively.	CO2	K2	7
b)	i)Determine the term independent of x in the expansion of $\left(x^2 + \frac{1}{x}\right)^{12}$ ii) Determine the coefficient of $x^5 y^{10} z^5 w^5$ in the expansion $(x + 7y + 3z + w)^{25}$	CO2	K3	8
(OR)				
4.a)	A cricket team of 11 is to be selected out of 14 players of whom 5 are bowlers. Find the number of ways in which this can be done so as to include at least 3 bowlers.	CO2	K2	8
b)	Determine the number of integers between 1 and 250 which are divisible by any of the integers2,3,5 or 7.	CO2	K3	7
5.a)	Let R denote a relation on the set of ordered pairs of positive integers by $(x, y)R(u, v)$ if and $only$ if $xv = yu$. Then show that 'R' is an equivalence relation.	CO3	K2	8
b)	Define Hasse diagram. Draw the Hasse diagram for the Poset $(P(S), \subseteq)$ where $S = \{1,2,3\}$	CO3	K2	7
(OR)				
6.a)	Let $(S, *)$ be a given semi group. There exists a homomorphism $g: S \to S^S$ where $(S^S, \circ)$ is a semi group of functions from $S \to S$ under	CO4	K2	7

	the operation of (left) composition.			
b)	Show that the fourth roots of unity forms a group with respect to multiplication of complex numbers.	CO4	K2	8
7.a)	How many integral solutions are there to $x_1 + x_2 + x_3 + x_4 + x_5 = 20$ where $x_1 \geq 3$, $x_2 \geq 2$, $x_3 \geq 4$, $x_4 \geq 6$ and $x_5 \geq 0$.	CO5	K2	8
b)	Solve the recurrence relation $S_n - 7S_{n-1} + 10S_{n-2} = 7.3^n$ for $n \geq 2$.	CO5	K3	7
	(OR)			
8.a)	Determine the coefficient of x^{14} in $(1+x+x^2+x^3)^{10}$	CO5	K2	8
b)	Solve the recurrence relation $a_n - 5a_{n-1} + 6a_{n-2} = 0, n \geq 2$ by using generating functions	CO5	K3	7
9.a)	Define isomorphism of graphs. Verify the following graphs are isomorphic or not. 	CO6	K2	8
b)	State and Prove Euler's formula for planar graphs.	CO6	K3	7
	(OR)			
10.a)	Show that a tree with 'n' elements has exactly 'n-1' edges.	CO6	K2	7
b)	Explain Kruskal's algorithm for minimal spanning tree with suitable example.	CO6	K3	8

[B19IT2102]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
II B. Tech I Semester (R19) Regular Examinations
PRINCIPLES OF SOFTWARE ENGINEERING
MODEL QUESTION PAPER

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
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			CO	KL	M
		UNIT - I			
1.	a).	Illustrate spiral model with neat diagram.	CO1	K3	7
	b).	Illustrate unified process.	CO1	K3	8
		OR			
2.	a).	Categorize process assessment and improvement.	CO1	K4	9
	b).	Identify the elements in software engineering practice.	CO1	K3	6
		UNIT - II			
3.	a).	Illustrate Extreme Programming (XP).	CO1	K3	5
	b).	Interpret any 4 agile process models.	CO1	K3	10
		OR			
4.	a).	Classify the characteristics of negotiating requirements and validating requirements.	CO1	K3	6
	b).	Design the complete usecase model for the following system **Vehicle Insurance Renewal System**	CO1	K4	9
		UNIT - III			
5.	a).	Identify the relationships in class diagram for **online shopping.**	CO2	K3	9
	b).	Design interaction diagrams for **Online Book Sales With Mobile SMS.** **(Any 2)**	CO2	K4	6
		OR			
6.	a).	Categorize requirements modeling for WebApps.	CO2	K4	10
	b).	Design state chart diagram with your own example.	CO2	K4	5
		UNIT - IV			
7.	a).	Categorize the concepts of design.	CO3	K4	9
	b).	Design component diagram for **Railway Reservation System**.	CO3	K4	6
		OR			
8.	a).	Illustrate Architectural Styles.	CO3	K3	8
	b).	Interpret designing class based components.	CO3	K3	7
		UNIT - V			
9.	a).	Categorize Testing Strategies for object oriented software.	CO4	K4	8
	b).	Interpret User Interface Analysis and Design.	CO4	K3	7
		OR			
10.	a).	Interpret path testing with example.	CO4	K3	8
	b).	Categorize Testing Strategies for WebApps.	CO4	K4	7

[B19IT2103]
II B. Tech I Semester (R 19) Regular Examinations
MICROPROCESSORS
DEPARTMENT OF INFORMATION TECHNOLOGY
MODEL QUESTION PAPER

TIME: 3Hrs.   **Max. Marks: 70**

Answer **ONE Question** from **EACH UNIT.**
All questions carry equal marks.

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UNIT-I			
1.	(a).	Explain the architecture of 8085 with neat block diagram.	7M
	(b).	Explain Different addressing modes in 8085.	7M
(OR)			
2.	(a).	Draw and explain signal description of 8085.	7M
	(b).	Explain in detail instruction formats and instruction set of 8085	7M
UNIT-II			
3.	(a).	Explain in detail different programming techniques.	7M
	(b).	Explain how instruction execution process occurs in 8085 for any one stack related instruction	7M
(OR)			
4.	(a).	Draw timing diagrams for CALL and RETURN instructions.	7M
	(b).	Explain the complete interrupt structure of 8085	7M
UNIT-III			
5.	(a).	Explain interfacing of memory unit with 8085.	7M
	(b).	Explain different I/O addressing modes	7M
(OR)			
6.	(a).	Draw and explain classification of memory units with a neat sketch.	7M
	(b).	Write an ALP to add two BCD numbers and show result in BCD.	7M
UNIT-IV			
7.	(a).	Explain modes of operation for 8255.	7M
	(b).	Explain about 8259 interrupt controller.	7M
(OR)			
8.	(a).	Explain A to D convertors. Explain how can you generate a square wave with 8085	7M
	(b).	Explain about memory mapped I/O and I/O mapped I/O.	7M
UNIT-V			
9.	(a).	Draw and explain the format of flag register in 8086.	7M
	(b).	Explain addressing modes in 8086.	7M
(OR)			
10.	(a).	Write a 8086 program to calculate factorial of a given number	7M
	(b).	Draw and discuss about general 8089 system timing diagram.	7M

[B19IT2103]

[B19 IT 2104]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
II B. Tech I Semester (R19) Regular Examinations
ADVANCED DATA STRUCTURES
MODEL QUESTION PAPER

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
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			CO	KL	M
		UNIT – I			
1.	a).	Explain Linked List? Write algorithm for inserting a node at the beginning of the Single Linked List with the help of suitable example?	CO1	K2	8
	b).	Define Sparse Matrix? How it is represented using Linked List?	CO1	K1	7
		OR			

2.	a).	Illustrate the following algorithms with examples
		  (i) Inserting element into a Double Linked List
		  (ii) Inserting element into a Circular Linked List
			CO1	K3	8

	b).	Write a program that accepts two polynomials as input and display the resultant polynomial due to the addition of input polynomials.	CO1	K3	7
		UNIT – II			
3.	a).	Define Binary Search Tree? How you can insert and delete in a Binary Search Tree? Give Example.	CO2	K1	8
	b).	Write the recursive algorithm for various tree traversal.	CO2	K3	7
		OR			
4.	a).	Construct an expression tree for the arithmetic expression: $(A + B * C) – ((D * E + F) / G)$	CO2	K3	7
	b).	Define heap. Explain heap sort algorithm. Apply heap sort algorithm to sort following list of elements in ascending order: 9, 3, 5, 27, 4, 67, 18, 31, 13, 20, 39, 21.	CO2	K1	8
		UNIT – III			
5.	a).	Explain Insertion, deletion and display procedures of AVL tree.	CO3	K2	8
	b).	Define the properties of Red Black Tree and what are the constraints maintained by Red Black Tree	CO3	K1	7
		OR			
6.	a).	Explain how to represent a Red Black Tree and perform the operations like insertion and deletion into Red Black Tree with example	CO3	K2	8
	b).	Differentiate Red Black Trees and AVL Trees	CO3	K2	8
		UNIT – IV			
7.	a).	Distinguish the features of Depth First Search (DFS) and Breadth First Search (BFS) in the context of graphs	CO4	K2	8
	b).	Explain Graph representation? What are the advantages of adjacency list representation over adjacency matrix representation of a graph?	CO4	K2	7
		OR			
8.	a).	How Warshall's algorithm is used to calculate the reachability matrix for the graph	CO3	K3	7

	b).	Apply Kruskals algorithm on the following graph to determine the minimum spanning tree 	CO3	K3	8
UNIT – V					
9.	a).	Explain External Sorting?	CO4	K2	7
	b).	Explain dynamic hashing using directories and directory less dynamic hashing?	CO4	K2	8
OR					
10.	a).	Define Hash function and Hash table? List some techniques that are used to implement Hash functions.	CO4	K1	7
	b).	Illustrate Double Hashing.	CO4	K2	8

II B. Tech I Semester (R 19) Regular Examinations
COMPUTER ORGANIZATION
DEPARTMENT OF INFORMATION TECHNOLOGY
MODEL QUESTION PAPER

TIME: 3Hrs.   **Max. Marks:70**

Answer ONE Question from EACH UNIT.
All questions carry equal marks.

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		UNIT-I	
1.	(a).	Explain about Fixed Point and Floating Point Representation with examples	7M,K3
	(b).	Explain about Booths multiplication algorithm with flow chart	7M,K2
		(OR)	
2.	(a).	Explain about division algorithm with example	7M,K3
	(b).	Describe Bus Structures in basic digital computer system	7M,K2
		UNIT-II	
3.	(a).	Describe Instruction cycle in computer system	7M.K2
	(b).	Design Arithmetic and Logic shift unit	7M,K2
		(OR)	
4.	(a).	Explain about Bus and Memory Transfer	7M,K2
	(b).	Explain about Computer instructions	7M,K2
		UNIT-III	
5.	(a).	Explain about General register organization with seven registers	7M,K2
	(b).	Expand the given statement in Three,Two,One ,Zero Addresses A=(B+C)*(D+E)	7M,K3
		(OR)	
6.	(a).	Describe the Addressing Modes i) Direct ii) Relative iii) Register with example	7M,K3
	(b).	Hardwired control Vs Micro programmed control	7M,K2
		UNIT-IV	
7.	(a).	Discuss about Memory Hierarchy	7M,K2
	(b).	Explain about Asynchronous Communication interface with neat diagram	7M,K2
		(OR)	
8.	(a).	Explain about Asynchronous Data transfer	7M,K2
	(b).	Explain Memory Mapping Techniques of Cache Memory	7M,K2
		UNIT-V	
9.	(a).	Describe the Characteristics of Multiprocessors	7M,K2
	(b).	Explain about Array Processor.	7M,K2
		(OR)	
10.	(a).	Describe Interconnection Structures with neat diagram	7M,K2
	(b).	Describe about Pipeline and vector processing	7M,K2

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
II B. Tech I Semester (R19) Regular Examinations
OBJECT ORIENTED PROGRAMMING THROUGH C++
MODEL QUESTION PAPER

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
*****

			CO	KL	M
		UNIT - I			
1.	a).	Differentiate between OOP and POP concepts.	CO1,PO1	K4	7M
	b).	Distinguish between c and c++.	CO1,PO1	K4	7M
		OR			
2.		Differentiate oops concepts along with examples.	CO1,PO1	K4	14 M
		UNIT - II			
3.	a).	Illustrate Copy constructor with example program.	CO2,PO3	K3	8M
	b).	Write a c++ program to create a class area and create 3 constructors to calculate area of a square, circle and rectangle? .	CO2,PO3	K3	7M
		OR			
4.	a).	Illustrate friend function and explain its characteristics.	CO2,PO1	K3	8M
	b).	Write a c++ program to create two classes each with a single member variable, find out the maximum of two variables using a friend function.	CO2,PO1	K3	7M
		UNIT - III			
5.	a).	Illustrate the statement "c++ provides provision for treating user defined data types just as built in types" with an example.	CO3,PO2	K3	8M
	b).	Write about Operator overloading with example.	CO3,PO2	K3	7M
		OR			
6.	a).	Write about inheritance in c++ with a program.	CO3,PO5	K3	8M
	b).	Write how call by reference mechanism implemented in c++.	CO3,PO5	K3	7M
		UNIT - IV			
7.	a).	Explain Abstract class and virtual class?	CO3,PO2	K2	8M
	b).	Identify visibility modes for data members in c++.	CO3,PO2	K2	7M
		OR			
8.	a).	Explain about virtual functions? With an example explain the usage of virtual functions.	CO3,PO2	K2	8M
	b).	Discuss Run time polymorphism.	CO3,PO2	K2	7M
		UNIT - V			
9.	a).	Discuss with necessary examples error handling and exception handling in c++.	CO4,PO3	K2	8M
	b).	Explain template? How they help in writing generic programs?	CO4,PO3	K2	7M
		OR			
10.	a).	Identify Principles of Exception handling.	CO4,PO3	K2	8M
	b).	Explain with a C++ Program how to handle multiple Exceptions.	CO4,PO3	K2	7M

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)::BHIMAVARAM
Code: B19 BS 2202
II B. Tech II Semester (R19)
PROBABILITY, STATISTICS AND QUEUING THEORY
MODEL QUESTION PAPER
(Common to CSE & IT)

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **All** Questions
All questions carry equal marks
*****

Q.No	Questions	CO	KL	M
1.a)	Explain a. Correlation and types of correlation b. Pearson's correlation coefficient and write its properties	CO1	K2	7
b)	Determine the regression lines of y on x and x on y for the following data <table><tr><td>X</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>Y</td><td>15</td><td>17</td><td>14</td><td>18</td><td>16</td><td>15</td></tr></table>	CO1	K3	8
	(OR)			
2.a)	Explain the methods in primary and secondary data.	CO1	K2	7
b)	Determine a 2nd degree regressed polynomial for the following data <table><tr><td>x</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>y</td><td>1</td><td>1.5</td><td>2.6</td><td>4.2</td><td>6.8</td></tr></table>	CO1	K3	8
3.a)	Define distribution function and write its properties.	CO2	K1	7
b)	A random variable X has the following probability distribution. <table><tr><td>x</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr><tr><td>f</td><td>k</td><td>2k</td><td>3k</td><td>4k</td><td>5k</td><td>6k</td><td>7k</td><td>8k</td></tr></table> Determine (i) the Value of K (ii) P(x≤2) (iii) P($2 \le x \le 5$)	CO2	K3	8
	(OR)			
4. a)	Define moment generating function and write its properties	C02	K1	7
b)	A random variable X has the probability density function given by $$f(x) = \begin{cases} x & if\ 0 \le x < 1 \\ 2 - x & if\ 1 \le x < 2 \\ 0 & elsewhere \end{cases}$$ Determine E(X) and V(X).	C02	K2	8
5.a)	Ten coins are thrown simultaneously. Determine the probability of getting at least i)seven heads ii) six heads	CO3	K3	7
b)	Establish that the mean and variance of a poison distribution are equal.	CO3	K3	8
	(OR)			
6.a)	In a normal distribution 31% of the items are under 45 and 8% are over 64. Determine mean and standard deviation	CO4	K3	8
b)	Prove the memory less property of exponential distribution.	CO4	K2	7

7.a)	Explain the following concepts
	  (i) Large and small samples (ii) Type I and Type II errors
	   (iii) Critical region and level of significance.
		C05	K1	8

b)	On the basis of their scores, 200 candidates of a civil service examination are divided into two groups the upper 30% and the 70%, Consider the first question of this examination. Among the first group, 40 had the correct answer, whereas among the second group, 80 had the correct answer. On the basis of these results, can one conclude that the first question is no good at discriminating ability of the type being examined here? (Use 5% los)	C05	K2	7
	(OR)			
8. a)	The height of 10 males of a given locality are found to be 70, 67, 62, 68, 61, 68, 70, 64, 64, 66 inches, Is it reasonable to believe that the average height is greater than 64 inches? Test at 5% significance level assuming that for 9 degrees of freedom $P(t>1.83) = 0.05$.	C05	K3	7
b)	Fit a binomial distribution and test for goodness of fit for the following data 	X	0	1	2	3	4
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f(x)	17	52	54	31	6		C05	K3	8
9.a)	Mention the characteristics of (M/M/1 : ∞/FIFO)queuing system.	C06	K1	7
b)	A T.V. repair man finds that the time spent on his jobs has an exponential distribution with mean 30 minutes. He repairs sets in the order in which they arrive. The arrival of the sets is approximately Poisson with an average of 10 per an eight-hour day. Find the repairman's idle time each day. How many jobs are ahead of the average set just brought in?	C06	K2	8
	(OR)			
10.a)	Explain Queuing theory with block diagram and discuss the characteristics of queuing models.	C06	K1	7
b)	Quality control department of a company is managed by a clerk and he takes 10 minutes on an average to check a machine. The machines usually arrive once in 15 mts., in order of the Poisson distribution. One hour of the machine is valued at Rs.15 and the clerk's time is valued at Rs.5 per hour. From above particulars ascertain the hourly cost of the queuing system relating to the quality control department.	C06	K3	8

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
II B. Tech II Semester (R19) Regular Examinations
JAVA PROGRAMMING
MODEL QUESTION PAPER

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
*****

UNIT-I				CO	K
1.	**(a).**	Define an Array and explain different types of arrays. By **applying** the concept of an array find the largest element from a given set of elements in an array.	**15M**	**CO1**	**K3**
		(OR)			
2.	**(a).**	Illustrate the differences between C,C++ and Java with a neat diagram	**8M**	**CO1**	**K3**
	(b).	Illustrate the structure of a java program	**7M**	**CO1**	**K3**
UNIT-II					
3.	**(a).**	Illustrate the concept of Inheritance and its different types with neat pictures.	**8M**	**CO2**	**K3**
	(b).	Construct a sample java program of user choice which applies the functionality of inheritance.	**7M**	**CO2**	**K3**
		(OR)			
4.		Explain polymorphism and its types. Construct a java program which Illustrates the functionality of method overloading and method overriding.	**15M**	**CO2**	**K3**
UNIT-III					
5.		Illustrate how to solve the problem of multiple inheritance in java with an example.Also differentiate between class and an interface.	**15M**	**CO3**	**K3**
		(OR)			
6.	**(a).**	Interpret the concept of packages in java.	**7M**	**CO3**	**K3**
	(b).	Construct a java program that shows the functionality of creating a public class in an already existing user defined package.	**8M**	**CO3**	**K3**
UNIT -IV					
7.	**(a).**	Compare **throw** and **throws** in Exception Handling	**8M**	**CO3**	**K3**
	(b).	Construct a java program which creates a user defined exception	**7M**	**CO3**	**K3**
		(OR)			
8.		Identify the different ways of creating a Thread in a java programming, show with examples programs where ever necessary.	**15M**	**CO3**	**K3**

		UNIT-V			
9.		Illustrate Life cycle of an applet . Construct a sample Applet program which displays current date.	**15M**	**CO4**	**K3**
		(OR)			
10.		Apply the concept of Event Handling and construct a java program which contains a button with name "day",when clicked on it displays the current day.	**15M**	**CO4**	**K3**

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
II B. Tech II Semester (R19) Regular Examinations
OPERATING SYSTEMS
MODEL QUESTION PAPER

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
*****

			CO	KL	M
		UNIT - I			
1.	a).	What is Operating System? Explain about Loosely coupled and Tightly coupled operating systems?	1	K2	7
	b).	What is Micro Kernel Structure? How it is different from Layered Structure?	1	K2	8
		OR			
2.	a).	What is an Interrupt? How the Interrupts are handled by Operating System?	1	K2	7
	b).	What is Virtual Machine? Explain different Hypervisors used in virtual machine?	1	K2	8
		UNIT - II			
3.	a).	The following table represents details of four processes	2	K3	10
	b).	Explain any two Multi Processor scheduling algorithms? List out its advantages and limitations	2	K3	5
		OR			
4.	a).	The following table represents details of four processes	2	K3	10
	b).	How the threads are scheduled? Explain	2	K3	5
		UNIT - III			
5.	a).	Explain the following terms with suitable examples i) Critical Section ii) Semaphore	3	K2	8
	b).	Design a solution for handling deadlock when it is occurred?	3	K3	7

Question 3 a). details:

Process	Arrival Time	Burst Time
P1	0	6
P2	4	8
P3	6	7
P4	2	3

Calculate average waiting time and Average Turnaround time using the following scheduling algorithms
i)   Non-Preemptive Shortest Job First Scheduling algorithm
ii)   Preemptive Shortest Job First Scheduling algorithm

Question 4 a). details:

Process	Arrival Times	Burst Time	Priority
P1	8	9	4
P2	6	5	5
P3	4	6	1
P4	4	5	6
P5	0	6	3
P6	2	8	2

Calculate average waiting time and Average Turnaround time using the following scheduling algorithms
i)   Non-Preemptive Priority scheduling algorithm
ii)   Preemptive Priority scheduling algorithm

		OR			
6.	a).	Write a semaphore solution for the Readers and Writers problem	3	K3	7
	b).	Design a deadlock avoidance algorithm? Outline the advantages and Limitations.	3	K3	8
		UNIT - IV			
7.	a).	Summarize different Free space management techniques used in contiguous memory allocation?	4	K2	7
	b).	What is Inverted Paging? How it different from paging?	4	K3	8
		OR			

8.	a).	Find out number of page faults for the given page requests using Least recently Used page replacement algorithm when
		     i) Number of frames =3
		     ii) Number of Frames = 4
		 Where, page requests: 5, 7, 6, 0, 7, 1, 7, 2, 0, 1, 7, 1, 0.
			4	K2	8

	b).	What is paged segmentation? How it is implemented in MULTICS?	4	K3	7
		UNIT - V			
9.	a).	What is system protection? Explain different protection mechanisms?	4	K2	7
	b).	How the Processes and files are managed in Unix operating system?	4	K2	8
		OR			
10.	a).	What is file system implementation? Explain i-node file allocation algorithm?	4	K2	7
	b).	How the Processes and files are managed in Windows operating system?	4	K2	8

[B19 IT2203]
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)
II B. Tech II Semester (R19) Regular Examinations
Data Base Management Systems
MODEL QUESTION PAPER

TIME: 3 Hrs.   **Max. Marks: 75 M**

Answer **ONE Question** from **EACH UNIT**
All questions carry equal marks
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			CO	KL	M
		UNIT - I			
1.	a).	Compare database systems with conventional file processing system on various aspects.	CO1	K2	8M
	b).	Explain different levels of abstraction offered by DBMS. Give an example at each level.	CO1	K2	7M
		OR			
2.	a).	Draw the architecture of Database Management System and explain the function of each component.	CO1	K2	8M
	b).	Consider University Database and define appropriate conceptual and external schemas.	CO1	K3	7M
		UNIT - II			
3.	a).	Consider the following schema of a bank database. Branches (B_name: string, B_city:string, Assets_Value:integer) Accounts(Acc_No:string, B_name:string, Balance:real) Loans(L_No:string, B_name:sring, Amount:real). Create tables for the above schema with primary key, foreign key and not null constraints wherever necessary.	CO2	K3	9M
	b).	Consider the following table: Students(*S_id*:string, S_name:string:, Date_of_Birth: date) i)Find the list of students who born in the month January. ii) Display the sub string of each student name from 2nd to 4th character.	CO2	K3	6M
		OR			
4.	a).	Consider the following schema and answer the following queries in SQL. Suppliers(*sid*:integer, *sname*:string, *address*:string) Parts(*pid*:integer, *pname*:string, *colour*:string) Catalog(*sid*:integer, *pid*:integer, *cost*:real) i)Find the ids and names of suppliers whose name begins with character "*A*". ii)Find the ids of suppliers who supply some Red colour part. iii)Find the ids of suppliers who supply either a Red colour part or a Green colour part. iv)Find the names of all parts supplied by supplier named John.	CO2	K4	10 M
	b).	Explain the meaning and use of null values under different situations	CO2	K2	5M
		UNIT – III			
5.	a).	A university database contains information about Professors (identified by empid) and Courses (identified by cid). Professors teach courses; each of the following situations describes the *Teaches* relationship. For each situation draw an ER diagram that describes it. i)Every professor must teach some course. ii) Every professor teaches exactly one course.	CO1	K4	6M

		iii) Every professor teaches exactly one course and every course must be taught by some professor.			
	b).	Consider the following schema and answer the following queries in SQL. Students(*sid*: string, sname:string, Date_of_Birth:date, GPA:real) Courses(*cid*:string, cname:string, credits:integer, offered_by:string) Enrolled(*sid*:string, *cid*:string) i)For each course offered by CSE department, find the total number of enrollments. ii) Find the sum of credits of all courses taken by student " *S*01". iii) Find the courses that have at least 10 enrollments.	CO2	K4	9M
OR					
6.	a).	Consider the following schema and answer the following queries in SQL. Students(*sid*: string, sname:string, Date_of_Birth:date, GPA:real) Courses(*cid*:string, cname:string, credits:integer, offered_by:string) Enrolled(*sid*:string, *cid*:string) i)Find the ids of students who had taken both the courses C01 and C02. ii) Write a correlated query to find the list of courses that are not taken by any student. iii)Find the departments that offer at least 5 courses.	CO2	K4	9M
	b).	Explain inner join and outer join operations on tables Courses and Enrolled of Question 6 (a).	CO2	K2	6M
UNIT - IV					
7.	a).	Consider the schema R(A,B,C,D,E) and the list of functional dependencies F={A→BC, EC→D,D→A}. Determine candidate keys of R.	CO3	K4	5M
	b).	Consider a relation schema and a set of functional dependencies and explain normalization up to BCNF.	CO3	K2	10 M
OR					
8.	a).	Explain multi valued dependency and 4th normal form.	CO3	K2	6M
	b).	Consider R(A,B,C,D,E) and the list of functional dependencies F={A→BC, EC→D,D→A}. What is the best normal form that R satisfies? Decompose R into a collection of 3NF relations.	CO3	K4	9M
UNIT - V					
9.	a).	Explain ACID properties of a transaction.	CO4	K2	6M
	b).	Explain search and insert operations on a B^+ tree index structure.	CO4	K2	9M
OR					
10.	a).	Explain the three phases of ARIES recovery algorithm.	CO	K2	8M
	b).	What are the three alternatives available regarding what to store as a data entry in an index? Explain about clustered and unclustered indexes.	CO	K2	7M

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THEORY OF COMPUTATION
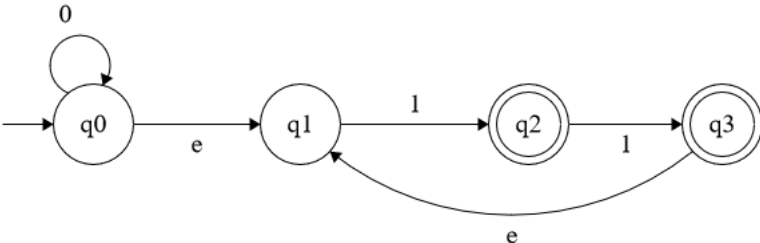**INFORMATION TECHNOLOGY**
MODEL QUESTION PAPER

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			CO	KL	M
		UNIT - I			
1.	a).	Convert the following NFA with € moves to DFA	CO1	K3	8
	b).	Design a DFA which accepts even number of 0's and 1's over alphabet $\Sigma=\{0,1\}$, with neat transition table and diagram.	CO1	K3	7
		OR			
2.	a).	Convert the Moore machine to determine residue mod 3 into Mealy machine.	CO1	K3	7
	b).	Construct the minimum state automata for the following	CO1	K3	8

	0	1
A	B	C
B	B	C
C	B	C
D	B	E
E	B	C

			CO	KL	M
		UNIT - II			
3.	a).	Construct Finite Automata for the regular expression 0*1*(101)*1	CO1	K3	8
	b).	Prove that the following language $\{a^n b^n \mid n \geq 1\}$ is not a regular.	CO1	K3	7
		OR			
4.	a).	Obtain the finite automata for the grammar G=({A,B},{0,1},P,A) Where P is given as A-> 0A | 1B | 1, B-> 0B | 0 .	CO1	K3	8
	b).	Write about closure properties of regular sets.	CO1	K2	7
		UNIT - III			
5.	a).	Reduce the following grammar such that there are no UNIT productions S → AA A → B | BB B → abB | b | bb	CO2	K3	7
	b).	Convert the following Context Free Grammar into Chomsky Normal Form S→aaaaS | aaaa	CO2	K3	8
		OR			
6.	a).	For the following grammar give the leftmost and rightmost derivation for the string '00101'. S → A1B A → 0A / ε B → 0B / 1B / ε	CO2	K3	7

	b).	Convert the following grammar to Greibach Normal Form $S \rightarrow ABA \mid AB \mid BA \mid AA \mid B$ $A \rightarrow aA \mid a$ $B \rightarrow bB \mid b$ b	CO2	K3	8
UNIT - IV					
7.	a).	Construct CFG for the PDA given below $A=(\{q0,q1\},\{0,1\},\{S,A\},\delta,q0,S,\phi)$ where δ is given as below $\delta (q0,1,S)=\{(q0,AS)\}$ $\delta (q0,\epsilon,S)=\{(q0,\epsilon)\}$ $\delta (q0,1,A)=\{(q0,AA)\}$ $\delta (q0,0,A)=\{(q1,A)\}$ $\delta (q0,1,A)=\{(q1,\epsilon)\}$ $\delta (q1,0,S)=\{(q0,S)\}$ b)	CO2	K3	8
	b).	Construct PDA for the language $L=\{WW^r$ /where $W \in (a+b)^*$, W^r is reverse of $W\}$.	CO2	K3	7
OR					
8.	a).	Design a PDA for the language $L = \{a^n b^{2n} / n>=1\}$	CO2	K3	8
	b).	Prove that the following language $\{a^p / p$ is aprime$\}$ is not a CFL.	CO2	K3	7
UNIT - V					
9.	a).	Design TM for performing proper subtraction of two numbers.	CO3	K3	8
	b).	Briefly write about Universal Turning Machine (UTM).	CO3	K2	7
OR					
10.	a).	Design Turing Machine for the Language $L=\{ a^n b^n c^n/n \geq 1 \}$	CO3	K3	7
	b).	What is post correspondence problem? Verify whether the following PCP has solution or not? $A=\{ba,ab,a,baa,b\}$, $B=\{ bab,baa,ba,a,aba \}$	CO3	K3	8