Discrete Mathematics

Qno	Question	Marks	Section
1	**a)** If $A=\{a,b,c,d\}$ and $B=\{x,y,z\}$. Let R be the following relation from A to B: $R=\{(a,x),(a,z),(d,y),(c,x),(b,z),(d,x)\}$ (i) Determine the matrix of the relation. (ii) Draw the arrow diagram of R. (iii) Find the inverse relation R^{-1} of R. **b)** Prove that for any positive integer m, the relation congruence modulo m is an equivalence relation on the integers.	8	Section-I
2	**a)** Let R is a relation on set of real numbers and it is defined as *(a, b)* ϵ R iff x-y is an integer. Then show that R is an equivalence relation. **b)** Suppose *(a, b)* ϵ R iff the price of book a is greater than or equal to the price of book b. Show that R is partially ordered relation.	8	Section-I
3	Define one-one, onto and composite functions. Prove that $$f^{-1} \circ g^{-1} = (g \circ f)^{-1} \quad \text{for} \quad f,g: Q \to Q \text{ such that}$$ $f(x) = 4x$ and $g(x) = x + 5$.	8	Section-I
4	Define POSET. Let R is a relation on set of integers ($\mathbb{Z}$) and defined as $R =\{(x,y) / x \text{ divides } y\}$ then prove that $\mathbb{Z}$ is POSET and also verify $\mathbb{Z}$ is TOSET or not?	8	Section-I
5	**a)** Show that the inclusion relation $\subseteq$ is a partially ordered relation on the power set of R. **b)** Let $S=\{1,2,3\}$, draw the Hasse diagram for the POSET $(P(S), \subseteq)$.	8	Section-I
6	**a)** Verify $R = \{(x,y) / x \le y\}$ is a partially ordering relation on the set of integers or not? **b)** Draw the Hasse diagram for $\{\{1,3,5,9,15,45\}, /\}$.	8	Section-I
7	Verify the following Hasse diagram is lattice or not? 	8	Section-I
8	**.** If A $= \{1,2,3,5,30\}$ and R is the divisibility relation, draw its Hasse diagram and prove that *(A, R)* is lattice but not distributed lattice?	8	Section-I

9	**a)** Let $I = \{0,1,2\}$, the functions f & g are defined from $I \to I$ as $\forall x \in I,\ f(x)=(x^2+x+1)$ mod 3, $g(x)=(x+2)^2$ mod 3, check whether f=g or not? **b)** If $f(x) = 2x+3$ and $g(x) = 2x$ and defined f, g: R→R, then find fog and gof.	8	Section-I
10	Show that the functions $f: R \to (1, \infty)$ and $g: (1, \infty) \to R$ defined by $f(x) = 3^{2x} + 1,\ g(x) = \dfrac{1}{2}\log_3(x-1)$ are inverses.	8	Section-I
11	Prove that for any propositions p,q and r, $[p \to (q \wedge r)] \to (p \to r)$ is a tautology by using a truth table.	8	Section-II
12	Obtain PDNF and PCNF of $(p \to q) \to r$.	8	Section-II
13	**a)** "If the figure is square then it is quadrilateral" Write its converse, inverse and contrapositive. **b)** Prove $(p \vee q) \wedge \sim(\sim p \vee q) \Leftrightarrow p \wedge \sim q$ using laws of logic.	8	Section-II
14	Construct the truth tables of the following compound propositions a) $(p \wedge q) \to r$ b) $(p \to q) \leftrightarrow [\sim p \vee q)] = \sim (q \vee p) \leftrightarrow (p \vee q)$	8	Section-II
15	Obtain DNF and CNF of $p \wedge (p \to q)$.	8	Section-II
16	**a)** Verify the validity of following argument "All integers are rational numbers" "Some integers are powers of 2" Therefore, "some rational numbers are powers of 2" **b)** Show that the premises "It is not sunny this afternoon and it is colder than yesterday" "We will go swimming only if it is sunny" "If we do not go swimming then we will take a Hyderabad trip" "If we take the Hyderabad trip then we will be home by sunset" lead to the conclusion "We will be home by sunset."	8	Section-II
17	**a)** Define quantifiers and symbolize the following argument and check for its validity: "If you send me an email, then I will finish writing the program" "If you do not send me an email, then I will go to sleep early"	8	Section-II

"If I go to sleep early then I will wake up feeling refreshed"

Therefore, "If I do not finish writing the program, then I will wake up feeling refreshed."

b) Explain universal and existential quantifiers. Symbolize the following argument and check for its validity:

"Tigers are dangerous animals."

"There are Tigers."

Therefore, "there are dangerous animals."

18	**a)** Verify the validity of the following argument "It is not sunny this afternoon and it is colder than yesterday," "We will go swimming only if it is sunny," "If we do not go swimming then we will take a Hyderabad trip" "If we take the Hyderabad trip then we will be home by sunset" Therefore, "We will be home by sunset." **b)** Check whether the following arguments are valid or not? "If a baby is hungry, then the baby cries." "If the baby is not mad, then he does not cry." "If the baby is mad, then he has a red face." Therefore, "If a baby is hungry, then he has a red face."	8	Section-II
19	**a)** Construct an argument using rules of inference to show that the hypothesis: "Ravi works hard" "If Ravi works hard, then he is a dull boy", and "If Ravi is a dull boy, then he will not get the job" imply the conclusion "Ravi will not get the job." **b)** Check whether the following arguments are valid or not? "All men are fallible" "All kings are men" Therefore, "All kings are fallible."	8	Section-III
20	Check whether the following arguments are valid or not? **a)** "If Sachin hits a century, then he gets a free car," "Sachin doesn't get a car" Therefore, "Sachin has not hit a century." **b)** "All engineering students are good in studies" "Sachin is good in studies" Therefore, "Sachin is an engineering student."	8	Section-III
21	a) Slove the recurrence relation $a_n = a_{n-1} + \frac{1}{n(n+1)}$, $a_0 = 1$. b) Find the solution of the recurrence relation $a_n = a_{n-1} + 2a_{n-2}$ and $a_0 = 2$; $a_1 = 7$.	8	Section-III

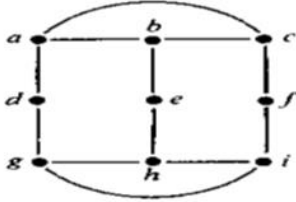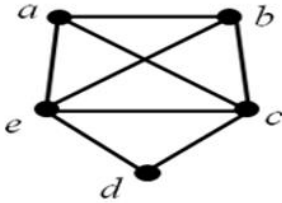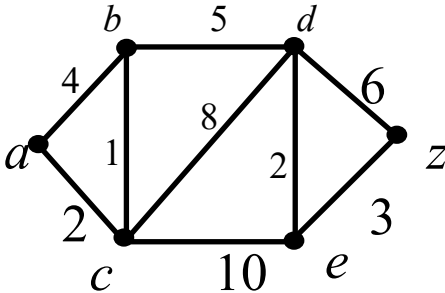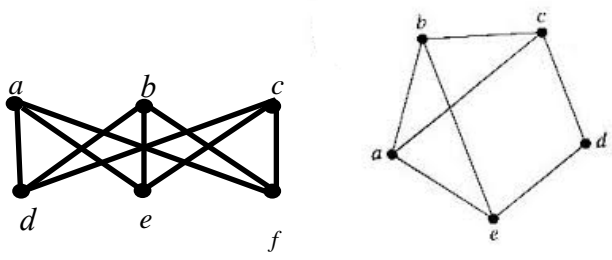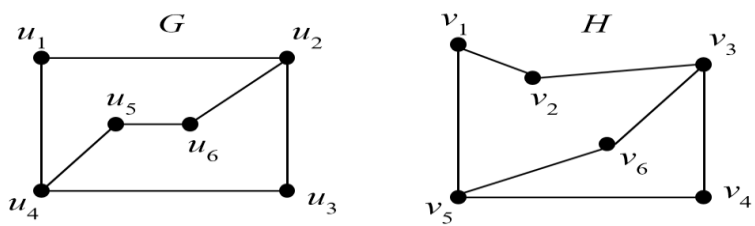|			
22	a) Slove the recurrence relation $a_n = 2a_{n-1} + 1$ for $n \geq$ 2 and $a_1 = 2$. b) Find the solution of the recurrence relation $a_n + 4a_{n-1} + 4a_{n-2} = 0$ and $a_0 = 2$; $\qquad a_1 = 1$.	8	Section-III
23	Solve the recurrence relation $a_n - 3a_{n-1} + 2a_{n-2} = 5n + 3$ for $n \geq 2$.	8	Section-III
24	Solve the recurrence relation $a_n - 7a_{n-1} + 10a_{n-2} = 7.3^n + 4^n$ for $n \geq 2$.	8	Section-III
25	a) Using generating function, solve the recurrence relation $a_n - 9a_{n-1} + 20a_{n-2} = 0$ for $n \geq 2$ with $a_0 = -3$, $a_1 = -10$. b) Solve the recurrence relation $a_k = 3a_{k-1}$ for $k = 1, 2, 3, \ldots$ and initial condition $a_0 = 2$ using generating functions.	8	Section-IV
26	a) Find an explicit formula for the Fibonacci numbers using recurrence relation. b) Solve the Divide and Conquer recurrence relation $a_n = ca_{\frac{n}{d}} + e$ for $a_1 = e, c \neq 0$ & $\qquad n = d^k$ where c, d & e are constants.	8	Section-IV
27	Find the number of integral solutions of the equation $x_1 + x_2 + x_3 = 20$ such that $\qquad 2 \leq x_1 \leq 5, 4 \leq x_2 \leq 7, -2 \leq x_3 \leq 9$.	8	Section-IV
28	Find number of (i) non-negative (ii) positive integral solutions of the equation $x_1 + x_2 + x_3 + x_4 = 25$.	8	Section-IV
29	a) Solve $a_n + a_{n-1} - 5a_{n-2} + 3a_{n-3} = 0$, $n \geq 3$ with $a_0 = 0$, $a_1 = 1$ and $a_2 = 0$. b) Determine the number of positive integers 'n' such that $1 \leq n \leq 250$ and 'n' is not divisible by 2 or 3 or 5.	8	Section-IV
30	**7.** In a survey of 120 people, it was found that: 65 read Newsweek magazine, 20 read both Newsweek and Time, 45 read Time, 25 read both Newsweek and Fortune, 42 read Fortune, 15 read both Time and Fortune, 8 read all three magazines. (a) Find the number of people who read at least one of the three magazines. (b) Draw its Venn diagram. (c) Find the number of people who read exactly one magazine. (d) Find the number of people who read Time and Fortune but not Newsweek.	8	Section-IV

31	**(a)** Draw a graph with the adjacency matrix $$\begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}$$ with respect to the ordering of vertices *a, b, c, d.* **(b)** Find the adjacency list for the following graph 	8	Section-IV
32	Use an adjacency matrix to represent the (a) graph and (b) the pseudo-graph shown below: (a) (b)	8	Section-IV
33	Obtain the incidence matrix of the following graphs. **(a)** **(b)**	8	Section-IV
34	Find the Euler path, Euler circuit for the following graphs. (a) (b)	8	Section-IV

35	**(a)** In a graph, that has 21 edges, 4 vertices of degree 3 and all other vertices of degree 2. Find the total number of vertices in this graph. **(b)** Show that the complete bipartite graph $K_{2,3}$ is a planar graph and complete graph of 5 vertices is non planar.	8	Section-IV
36	Find a Hamiltonian path for the following graph: (a) (b)	8	Section-IV
37	State and prove Euler's formula.	8	Section-IV
38	Use Dijkstra's algorithm to find the length of a shortest path between *a* and *z* in the weighted graph. 	8	Section-V

39	Find the chromatic number for following graph	8	Section-V
40	Show that the following graphs are Isomorphic. 	8	Section-V
41	Define group. Show that $S = \{1, \omega, \omega^2\}$ is a group under multiplication.	8	Section-V
42	Define binary operation. Check whether $a * b = a + b - ab$ is an abelian group or not?	8	Section-V
43	Define subgroup. Prove that $H = \{0,2,4\}$ forms a subgroup of $<Z_6, +>$.	8	Section-V
44	Define order of a group and order of an element. Find order of $U = \{1,2,4,7,11,13,14\}$ under X_{15} also find order of an elements 2 and 7	8	Section-V
45	Define normal subgroup. Show that H = $\{1, -1\}$ is a normal subgroup of the group G = $\{1, -1, i, -i\}$ under multiplication.	8	Section-V
46	Define kernel of a group homomorphism. Find the kernel of $f(x) = x^4$, where $f: R{\rightarrow}R$, $x \in R$.	8	Section-V
47	Define Ring. Show that the set Z of integers with respect to usual addition and multiplication is a commutative ring with unit element.	8	Section-V
48	Define subring. Show that the set of matrices $\begin{bmatrix} a & b \\ 0 & c \end{bmatrix}$ is a subring of 2x2 matrices whose elements are integers.	8	Section-V
49	Prove the set of even integers is a ring with respect to usual addition and multiplication of integers.	8	Section-V
50	The intersection of two subrings of ring R is a subring of R.	8	Section-V

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Database Management Systems

Qno	Question	Marks	Section
1	What is Data Model? List out various Data Model and explain with suitable example.	8	Section-I
2	Describe the Structure of Database Management system with a neat diagram.	8	Section-I
3	Differentiate between File System and Database Management System.	8	Section-I
4	What is meant by Data Abstraction? Describe various levels of Data Abstraction.	8	Section-I
5	Define Data Independence. Describe Physical Data Independence and Logical DataIndependence with a neat diagram.	8	Section-I
6	Define Database Management System (DBMS). List out the advantages and various applications of DBMS.	8	Section-I
7	Explain Storage System and its types in DBMS briefly.	8	Section-I
8	List the types of Database Users with their roles.	8	Section-I
9	Define Data Model Schema and instance. Illustrate with an example.	8	Section-I
10	What is 3 level Architecture for DBMS and also explain how it can be used.	8	Section-I
11	What is Relational Model? List out various Relational Integrity Constraints with examples.	8	Section-II
12	List out the types of keys and explain them with examples.	8	Section-II
13	Construct an Entity Relationship diagram for a University Database. Assume your own entities (Minimum of 5 entities), attributes and relations.	8	Section-II
14	What is Relational Algebra? List out various types of Relational operations and explain with an example.	8	Section-II
15	What is Relational Calculus? Describe types of Relational Calculus with suitable example.	8	Section-II
16	Illustrate various types of attributes with notations. What is meant by Mapping Cardinality? List and explain types of Cardinality Ratios.	8	Section-II
17	Translate Entity Relationship diagram into a collection of tables with associated constraints to a relational database schema.	8	Section-II
18	Define view. Write the syntax for creating updating and destroying a view with suitableexample for Simple and Complex Views.	8	Section-II
19	Explain the following terms with examples. i. Generalization ii. Specialization iii. Aggregation	8	Section-II
20	Illustrate different types of Constraints with examples.	8	Section-II
21	Convert ER Diagram to Relational Model by listing the rules for attributes, and relationship.	8	Section-III

22	Explain Create, Insert, Delete, Select commands with examples.	8	Section-III
23	Identify and list various Data Manipulation Language (DML) commands. Explain DML commands with suitable example.	8	Section-III
24	Identify and list various Data definition Language (DDL) commands. Create a table by specifying key and referential constraints in Structured Query Language.	8	Section-III
25	Make use of Structured Query Language in solving the following with proper example i. Sub queries & Correlated Queries ii. Joins iii. Aggregate functions	8	Section-III
26	List and explain various commands on Transaction Control Language and Data Control language.	8	Section-III
27	Explain how Order By , Group By , Having Clauses used in SQL	8	Section-III
28	How would you use the operators IN, EXISTS, BETWEEN and LIKE in writing sub queries? Why are they useful? Explain with an example.	8	Section-III

29	Consider following relations and write SQL queries for given statements. Assume suitable constrains:
	Instructor (ID, Name, Dept_name , Salary)
	Teaches (ID, Course_id, Sec_id, Semester (even/odd),Year)
	    i) Find the average salary of the instructors in CSE department.
	    ii) Find the number of instructors in each department who teach a course in even semester of 2016
	    iii) Find the names of instructor with salary amounts between 30000 and 50000.
	    iv) Find the minimum and maximum Salary in each department.
	    v)Find the Instructor names that start with letter "A"
		8	Section-III

30	Illustrate an example for Nested Queries and Correlated Queries.	8	Section-III
31	Define Schema Refinement. Analyze the problems caused by redundancy.	8	Section-IV
32	Define Functional Dependency. List and explain various Functional Dependencies.	8	Section-IV
33	Define normalization. Interpret the data by applying various normalization techniques such as 1Normal Form (1NF), 2NF and 3NF to reduce redundancy in database tables.	8	Section-IV
34	What is the relationship exists between 3Normal Form (3NF) and Boyce Codd NormalForm (BCNF). Distinguish between 3NF and BCNF. Consider any one relation schema. Which is 2NF and convert into BCNF?	8	Section-IV
35	Define Decomposition. Describe various types of Decomposition with suitable example.	8	Section-IV
36	What are the problems caused by Redundancy? Explain about	8	Section-IV

	Normalization and need for normalization.		
37	Define and explain the Axioms of Functional Dependencies.	8	Section-IV
38	Explain various types of Inference Rules used for Normalization.	8	Section-IV
39	Consider a relation R (A, B, C, D, E, F, G) with the functional dependencies set F:{A → BC BC → DE, D → F, CF → G} Find all candidate keys in relation R.	8	Section-IV
40	Given a relation R (P, Q, R, S, T, U, V, W, X) and Functional Dependency set F: {PQ → R, QS → TU, PS → VW, and P → X}, determine the given R is in which normal form?	8	Section-IV
41	List out the ACID properties. Describe the transaction states with a neat diagram.	8	Section-V
42	Describe Lock based concurrency control with suitable example.	8	Section-V
43	Explain different types of Locks used in concurrency control.	8	Section-V
44	Describe concurrency control with Time stamp based locking protocols.	8	Section-V
45	Explain concurrency control with optimistic methods.	8	Section-V
46	Define locking protocol. Describe the Strict Two-Phase Locking protocol with an example	8	Section-V
47	What is 2-Phase Locking? Explain phases in it.	8	Section-V
48	Classify the types of Schedules. List out the benefits of Serializability in DBMS.	8	Section-V
49	 **Schedule S1** Apply Precedence Rule and check whether the above given Schedule is Serializable or not.	8	Section-V
50	Define Serializability. Explain Conflict Serializability and View Serializability with an example.	8	Section-V

The table in question 49:

T1	T2	T3
Read(A)		
A:= f_1(A)	Read(B)	
		Read(C)
	B:= f_2(B)	
	Write(B)	
		C:= f_3(C)
		Write(C)
Write(A)		
		Read(B)
	Read(A)	
	A:= f_4(A)	
Read(C)		
	Write(A)	
C:= f_5(C)		
Write(C)		
		B:= f_6(B)
		Write(B)

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Web Design and Development

Qno	Question	Marks	Section
1	a) Define web hosting and its types. b) What are Hyperlinks on a webpage? Discuss tags which are used to create hyperlinks.	4+4	Section-I
2	Write in detail about building block of HTML	8	Section-I
3	a) Differentiate between static and dynamic websites. b) List the advantages of HTML5.	4+4	Section-I
4	a) Explain "List" and its types with an example HTML program. b) Define iFrames. Explain iFrame attributes with one example program.	4+4	Section-I
5	Explain i) What is HTML ii) History of HTML iii) Features of HTML	2+2+4	Section-I
6	Write a HTML program to create a time table.	8	Section-I
7	Elaborate the procedure to validate a form in HTML with suitable example program.	8	Section-I
8	Write a HTML code for creating table which consists of product details.	8	Section-I
9	Explain input types of form and explain each type with suitable example	8	Section-I
10	Write a HTML code to demonstrate profile of a student with multiple fields.	8	Section-I
11	Discuss about the different types of selectors in CSS with suitable example.	8	Section-II
12	How to add CSS in HTML pages to format the document according to information in the style sheet with types?	8	Section-II
13	To discuss the CSS background property is used to define the background effects on element and there are 5 CSS background properties that affect the HTML elements	8	Section-II
14	a) What is the color property in CSS is used to set the color of HTML elements b) Explain different shadows with example programs	4+4	Section-II

15	Explain analysis of different CSS Gradients with example programs?	8	Section-II
16	Write about text properties in CSS with syntax and examples.	8	Section-II
17	Write a CSS code for creating a webpage to list all programs offered by university using DIV tag	8	Section-II
18	What is attribute selector? Explain how it is different from other selectors with example	8	Section-II
19	Differentiate padding with margin using a DIV tag and demonstration with syntax and example	8	Section-II
20	Write CSS code for creating a webpage for game with instructions	8	Section-II
21	a) Define java script and its applications? b) What is the difference between JavaScript and Java?	4+4	Section-III
22	What are primitive data types in Javascript? Explain their syntax with example	8	Section-III
23	Describe javascript placement in HTML with different examples?	8	Section-III
24	Write short notes on Type Conversion and Operators	8	Section-III
25	What are the pop-up boxes available in JavaScript?	8	Section-III
26	a) What are the different datatypes present in javascript? b)Explain javascript operators?	4+4	Section-III
27	Write a Javascript code for swapping two numbers without using third variable	8	Section-III
28	Explain Document object in detail and explain different methods functionalities.	8	Section-III
29	What is innerHTML? explain the purpose of innerHTML in javascript	8	Section-III
30	Write a Javascript code for finding simple and compound interest using function and rendering on page	8	Section-III
31	Briefly explain the Conditional statements of JavaScript.	8	Section-IV
32	Write a Javascript code for finding largest number among 4 using conditional statements	8	Section-IV
33	What are the different types of looping statements available in JavaScript?	8	Section-IV
34	Write a program to perform summation of individual element of a given number (Eg: num=127 => 1+2+7= 10)	8	Section-IV

35	Define a named function in JavaScript and explain the function parameters?	8	Section-IV
36	Write a program to return product of two real values only if the result if non-negative value.	8	Section-IV
37	Write short notes on: a) Call () b. Apply ()	4+4	Section-IV
38	a) Write a JavaScript program to display whether a given number is prime or not. b) How do you create a function using "function overloading" concept	4+4	Section-IV
39	What are strings? Perform concatenation operation on any given two strings using Javascript code	4	Section-IV
40	What are arrays? Explain arrays in detail with suitable examples	8	Section-IV
41	What is a framework? Explain the procedure to develop a webpage using Bootstrap	8	Section-V
42	a) What is Bootstrap? Explain the Responsive Web Design. b) Explain why Bootstrap is preferred for website development	4+4	Section-V
43	Explain about Bootstrap table in detail with examples	8	Section-V
44	Define Bootstrap grid and explain the types of bootstrap grid classes.	8	Section-V
45	What is the difference between Bootstrap 3 and Bootstrap 4	8	Section-V
46	a) How would you implement a carousel in Bootstrap b) How do create Nav elements in Bootstrap	4+4	Section-V
47	What is bootstrap pagination and how are they classified	8	Section-V
48	Explain themes in Bootstrap in detail to create a webpage for a website	8	Section-V
49	Design a webpage like Wikipedia using bootstrap framework.	8	Section-V
50	What are filters in Bootstrap? Explain filters using a code.	8	Section-V

Computer Networks

1.	What is a computer network? Explain LAN, MAN and WAN with examples?	8M	Section-I
2.	a) What is Topology? Discuss about various network topologies with suitable diagram?	4M	Section-I
	b) Explain the functions of various layers in ISO-OSI reference model.	4M	Section-I
3.	a) Explain about Protocol stack of TCP/IP with proper diagrams.	4M	Section-I
	b) Discuss about similarities and difference between TCP/IP and OSI Reference Model?	4M	Section-I
4.	Discuss about mechanism of following devices: a) Hub b) Bridge c) Router d) Gateway e) Switch	8M	Section-I
5.	a)Write short notes on: NIC Card and MAC address	4M	Section-I
	b)Firewall and Proxies	4M	Section-I
6.	Classify about types of major classes of guided media.	8M	Section-I
7.	Describe in detail about Network architecture with a neat diagram?	8M	Section-I
8.	a) Explain the characteristics of data communication.	4M	Section-I
	b) Describe simplex, half-duplex and full-duplex mode of transmission.	4M	Section-I
9.	Distinguish between point to point links and multi point links. Give relevant diagrams.	8M	Section-I
10.	a) Compare connection oriented and connectionless service.	4M	Section-I
	b) Explain the functions and protocols and services of each layer?	4M	Section-I
11.	a) Elaborate the design issues of data link layer.	4M	Section-II
	b) What is the need for framing? What are the different framing techniques?	4M	Section-II
12.	a) Explain in detail about the sliding window protocol using Selective Repeat ARQ.	4M	Section-II
	b) Explain in detail about the sliding window protocol using Go-Back-N.	4M	Section-II
13.	Explain the CRC error detection technique using generator polynomial X4+X2+1 and data 11100011.	8M	Section-II
14.	a) What is the purpose of CSMA/CD explain with example.	4M	Section-II
	b) Compare and contrast pure aloha and slotted aloha.	4M	Section-II
15.	a) Describe the stop and wait protocol with neat sketch.	4M	Section-II
	b) Explain flow control mechanism using Sliding window protocol.	4M	Section-II
16.	a) Write the procedure and algorithm to calculate the traditional checksum.	4M	Section-II
	b) Suppose that a message 1001 1100 1010 0011 is	4M	Section-II

	transmitted using Internet Checksum (4-bit word). What is the value of the checksum?		
17.	Describe about services provided by the data link layer.	8M	Section-II
18.	Describe Bluetooth and its architecture with neat sketch.	8M	Section-II
19.	What is the remainder obtained by dividing $x^7 + x^5 + 1$ by the generator polynomial $x^3 + 1$?	8M	Section-II
20.	a) A bit string, 0111101111101111110, needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?	4M	Section-II
	b) Explain in detail about byte count, flag bytes with byte stuffing, bit stuffing, physical layer coding violation.	4M	Section-I
21.	a) Compare Virtual-Circuit and Datagram networks.	4M	Section-III
	b) Discuss about the concept of internetworking in detail.	4M	Section-III
22.	a) Explain briefly about the shortest path routing algorithm.	4M	Section-III
	b) Discuss the following: i) Broadcast Routing ii) Multicast Routing	4M	Section-III
23.	a) Explain about classes of IP addresses used in network layer	4M	Section-III
	b) Explain Internet Protocol with the neat block diagram of IPv4 header format.	4M	Section-III
24.	a) Explain leaky bucket and token bucket algorithm for traffic shaping.	4M	Section-III
	b) Explain following Jitter Control with neat and clean diagram.	4M	Section-III
25.	a) Explain Link State Routing with an example.	4M	Section-III
	b) Distance Vector Routing algorithm with suitable example.	4M	Section-III
26.	Describe in detail about switching and forwarding.	8M	Section-III
27.	Explain about routing algorithms.	8M	Section-III
28.	a) Differentiate IPv4 and IPv6.	4M	Section-III
	b) Explain count to infinity problem.	4M	Section-III
29.	Explain in detail about flooding and shortest path routing (Dijkstra's algorithm) with neat diagram.	8M	Section-III
30.	Explain Internet protocol and Sub-netting with neat sketches.	8M	Section-III
31.	Explain in details about transport services and elements of transport layer?	8M	Section-IV

32.	a) Illustrate the connection establishment and release in transport layer.	4M	Section-IV
	b) Explain the Closed Loop Congestion Control.	4M	Section IV
33.	What are the general principles of congestion control? Explain?	8M	Section IV
34.	What is TCP? Discuss about TCP connection establishment and Connection release phases	8M	Section IV
35.	a) Discuss about the network performance issues	4M	Section IV
	b) Describe Datagram Format of UDP	4M	Section IV
36.	a) Explain about elements of transport protocols	4M	Section IV
	b) Briefly explain the internet transport protocol	4M	Section IV
37.	Show different approaches in packet switching. Explain them in detail.	8M	Section IV
38.	a) Illustrate in detail about UDP header format with neat sketch.	4M	Section IV
	b) Describe in detail about UDP message queue technique with neat sketch.	4M	Section IV
39.	How is congestion controlled? Explain in detail about TCP's general policy of handling congestion?	8M	Section IV
40.	Explain about UDP and TCP features with neat diagrammatic representation.	8M	Section IV
41.	What is electronic E-mail? Describe in brief about the two architectures of E-Mail.	8M	Section V
42.	Explain in detail about following a) www b) Firewalls	4M	Section V
	b) Can you list five types of result codes?	4M	Section V
43.	a)Briefly discuss about the operational model of HTTP	4M	Section V
	b)Explain about SNMP protocol with example	4M	Section V
44.	a) Describe the elements of network management in detail.	4M	Section V
	b) Explain the functions performed by DNS? Give example?	4M	Section V
45.	Write short notes on URLS.	8M	Section V
46.	Explain how security is provided in internet operations in detail?	8M	Section V

47.	Write short notes on IMAP and MIME with an example.	8M	Section V
48.	Explain the operation of SNMP protocol in detail?	8M	Section V
49.	Explain TELNET in detail.	8M	Section V
50.	Describe briefly about the request message format and response message format of HTTP.	8M	Section V

Software Engineering

Qno	Question	Marks	Section
1	a. What are the software applications? b. Discuss about the evolving role of software?	4 4	Section-I
2	a. List the characteristics of software? b. explain about process framework?	4 4	Section-I
3	Define "Software myth"? Discuss on various types of software myths and the true aspects of these myths?	8	Section-I
4	Justify the statement "software engineering- A Layered technology"?	8	Section-I
5	Write a short note on the capability maturity model?	8	Section-I
6	What is the use of software development process models? Explain.	8	Section-I
7	Explain why incremental development is the most effective approach for developing business software systems. Why is this model less appropriate for real time systems engineering?	8	Section-I
8	a. Explain briefly about evolutionary model? b. Explain briefly about unified process model?	4 4	Section-I
9	Discuss Waterfall model with suitable diagram. Give its merits and demerits?	8	Section-I
10	Explain in detail about agile development models?	8	Section-I
11	a. List the functional requirements of software? b. List the non-functional requirements of software?	4 4	Section-II
12	a. Write short note on requirements specification? b. What are the characteristics of good SRS document?	4 4	Section-II
13	a. What is the goal of requirements analysis phase? b. Give reasons why the requirements analysis phase is a difficult one?	4 4	Section-II
14	Discuss about object model in detail?	8	Section-II
15	Explain behavioural model with suitable examples?	8	Section-II
16	Summarize the concept of software requirement specification?	8	Section-II
17	Explain about context model with suitable examples?	8	Section-II
18	Explain about data model with suitable examples?	8	Section-II
19	a. Summarize the need of SRS document? b. Explain the contents in SRS document?	8	Section-III
20	a. List the user requirements ? b. List the system requirements?	4 4	Section-III

21	Summarize the Design concepts of software engineering?	8	Section-III
22	a. Explain abstraction in the context of design concept? b. Define design process? Discuss the characteristics of good design?	4 4	Section-III
23	List the architectural styles and patterns?	8	Section-III
24	Compare the Black Box testing and White Box testing with an example.	8	Section-III
25	a. What is black box testing? Is it necessary to perform this? b. Explain various test activities	4 4	Section-III
26	Summarize the concept of art of debugging?	8	Section-III
27	Discuss about test strategies for conventional software?	8	Section-III
28	a. Explain about validation testing? b. Explain about system testing in detail?	4 4	Section-III
29	What is the strategic approach to software testing?	8	Section-III
30	Explain about design model with diagram?	8	Section-III
31	List and explain the various software quality factors?	8	Section-IV
32	List out Software Quality Assurance activities with clear explanation?	8	Section-IV
33	a. Explain about risk projection b. summarize about risk refinement?	4 4	Section-IV
34	Compare reactive and proactive risk strategies?	8	Section-IV
35	Explain about software risks in detail?	8	Section-IV
36	List the ISO 9000 quality standards?	8	Section-IV
37	Explain the overview of RMMM plan?	8	Section-IV
38	Summarize the concept of formal technical reviews?	8	Section-IV
39	Explain about statistical software quality assurance?	8	Section-IV
40	a. Define software quality and list quality concepts? b. give the overview of software reliability concept?	4 4	Section-IV
41	Explain briefly about software project management in detail?	8	Section-V
42	List the software project management activities?	8	Section-V
43	Explain the concept of effort estimation?	8	Section-V
44	What are the challenges faced in software projects?	8	Section-V
45	Summarize the concept of step wise planning for a project?	8	Section-V
46	What are called as deliverables of a project?	8	Section-V
47	Explain about project scope in detail?	8	Section-V
48	a. What are the objectives of software project management? b. Explain the concept of infrastructure wrt software project management?	4 4	Section-V
49	a. What are the goals of software project management? b. Discuss the need of software project management?	8	Section-V
50	Explain few problems associated with software projects ?	8	Section-V

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Principles of Operating System

Qno	Question	Marks	Section
1	What is computer? Explain basic elements of Computer.	8	Section-I
2	Discuss about Evolution of Microprocessor?	8	Section-I
3	Define operating system. Explain and list out the services provided by the operating system in detail?	8	Section-I
4	a) Explain about Main Memory Hierarchy? b) Write short notes on Cache Memory?	4+4	Section-I
5	a) Discuss about Direct Access memory? b) Discuss about system components in OS?	4+4	Section-I
6	What is Operating System? Explain the functions and objectives of Operating System.	8	Section-I
7	Discuss about Evolution of Operating System?	8	Section-I
8	Discuss about Microsoft Windows Overview?	8	Section-I
9	a)Discuss the services offered by the Operating Systems b) Discuss about Traditional UNIX system and Modern UNIX system?	4+4	Section-I
10	Discuss the system components of OS and explain the structure of OS with neat sketch?	8	Section-I
11	What is Process? Discuss about Process states with a neat sketch?	8	Section-II
12	a) Discuss about Process Control block with a neat sketch? b) Explain the operations performed on a process?	4+4	Section-II
13	Discuss the necessary conditions for a deadlock to occur?	8	Section-II
14	Discuss about Resource Allocation Graph?	8	Section-II
15	Explain about Deadlock Detection and write the algorithm for it with a suitable example?	8	Section-II
16	a) Explain the concept of threads. b) Discuss the different threading issues in Multithreading?	4+4	Section-II
17	Explain the difference between Process and Threads.	8	Section-II
18	a) Explain the System model for Deadlocks? b) Discuss the methods for handling deadlocks?	4+4	Section-II
19	Explain in detail about the deadlock prevention and its methods?	8	Section-II
20	a) Discuss Wait for Graph in deadlock detection? b) List out the methods to recover from deadlock?	4+4	Section-II
21	a)Define Scheduling with example? b) Discuss about Scheduling Criteria?	4+4	Section-III
22	Explain First Come First Serve Algorithm with suitable example and list out the Advantages and Disadvantages?	8	Section-III
23	Explain Shortest Job First Algorithm with suitable example and list out the Advantages and Disadvantages?	8	Section-III
24	Explain Round Robin Scheduling Algorithm with suitable example	8	Section-III

	and list out the Advantages and Disadvantages?		
25	a) Discuss about the memory management? b) Explain the Logical and physical address space?	4+4	Section-III
26	Discuss about contiguous memory allocation?	8	Section-III
27	a) Discuss about Segmentation? b) Explain the concept of Paging?	4+4	Section-III
28	Explain the paging concept in memory management with neat sketch?	8	Section-III
29	Explain the different page replacement algorithms with a suitable example?	8	Section-III
30	Discuss about Virtual Memory?	8	Section-III
31	Explain the file system interface and its operations?	8	Section-IV
32	Discuss the different Access methods used in the file system?	8	Section-IV
33	What is a Directory? Explain the different Directory structures used in File system?	8	Section-IV
34	Explain the different system calls in file I/O i. Read ii. Write iii. Close iv.open v. lseek	8	Section-IV
35	a) Discuss about the file structure? b) Explain allocation methods in file?	4+4	Section-IV
36	a)Explain about file protection b) Discuss the File access methods?	4+4	Section-IV
37	Explain the different system calls used for file I/O Operations?	8	Section-IV
38	Discuss about disk scheduling algorithms in OS?	8	Section-IV
39	Explain the FCFS and SSTF disk scheduling algorithm with suitable example?	8	Section-IV
40	Explain the SCAN and C-SCAN disk scheduling algorithm with suitable example?	8	Section-IV
41	Discuss about Computer Security?	8	Section-V
42	Explain about Threats?	8	Section-V
43	a) Discuss about Attacks ? b) Discuss about Assets?	4+4	Section-V
44	Explain about Intruders?	8	Section-V
45	Write notes on Malicious Software?	8	Section-V
46	What is computer virus? Explain types if viruses?	8	Section-V
47	a) Discuss about Worms? b) Discuss about Bots?	4+4	Section-V
48	What is Authentication? Explain in detail about Authentication?	8	Section-V
49	Discuss about Access Control?	8	Section-V
50	Explain about Intrusion Detection?	8	Section-V

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Financial Accounting and Management

Qno	Question	Marks	Section
1	What do you mean by Financial Accounting? Explain it Functions of financial Accounting. **(S)**	8	Section-I
2	What is the Accounting scope in a firm? **(S)**	8	Section-I
3	Explain the accounting concepts and conventions. **(M)**	8	Section-I
4	Discuss the various phases in accounting process **(M)**	8	Section-I
5	List down the International accounting standards in detail. **(D)**	8	Section-I
6	What are the various steps of Accounting Cycle? Explain **(M)**	8	Section-I
7	Write a short note on A) GAAP B) IASB C) IFRS **(M)**	3+3+2	Section-I
8	Explain Branches of Accounting and Accounting Equation**. (S)**	8	Section-I
9	Narrate the different applications of accounting.**(S)**		Section-I
10	What do you understand about accounting standards? List out the accounting standards.	4+4	Section-I
11	Journalize the following transactions of Gautam & Co	8	Section-II

June 1	Karthik commenced business with Rs.20,000.
June 2	Paid into bank Rs.5,000.
June 3	Purchased Plant worth Rs.10,000 from Modi & Co.
June 6	Goods worth Rs.4,000 sold to Anbu
June 8	Sold goods worth Rs.2,000 for cash.
June 10	Goods returned by Anbu Rs.50.
June 15	Paid rent Rs.250.
June 18	Withdrawn from bank for office use Rs. 2,500.
June 20	Paid Salaries Rs.1,800.
June 25	Withdrawn for personal use Rs.250.
June 26	Goods returned to Anwar Rs.100.
June 27	Paid for office furniture Rs.1,500 by cheque.
June 28	Received Rs.3,900 cash from Anbu and discount allowed Rs.50.
June 29	Paid Anwar on account Rs.4,800 and discount allowed by him Rs.100.

12	What is Double Entry System? List out the Advantages of double entry system. **(S)**	8	
13	What are the different types of accounts and their posting rules/ Golden rules with suitable examples **(S)**	8	Section-II
14	Discuss about the Revenue and Capital items. **(M)**	8	Section-II
15	Different types of Vouchers entered in Tally **(M)**	8	Section-II
16	How the balance sheet is useful for shareholders, give an example? **(D)**	8	Section-II
17	Describe the features available in Tally ERP9 for Accounting? **(M)**	8	Section-II
18	Elucidate the objectives of financial statements. **(D)**	8	Section-II
19	Shah Garden Center is retail garden supplier. Record the transactions needed to journalize, post to respective ledger account and prepare of the following for October, 2011 of the current year: *Oct. 2* Purchased inventory on credit terms of 1/10 net 30. FOB shipping point, for Rs. 3,000. Freight charges on the purchase were Rs. 150. *Oct. 9* Sold garden supplies on credit terms 3/20 net 30, FOB shipping point, for Rs. 4,000. The cost of the supplies sold was Rs. 2,500. *Oct. 10* Paid the amount owed on account for the Oct. 2 inventory purchase. *Oct. 15* Received merchandise that was returned as defective, originally sold for Rs. 500 on Oct. 9. The original cost of the supplies returned was Rs. 275. *Oct. 25* Received payment on account for the Oct. 9 sale less the appropriate sales discount. *Oct. 28* Inventory lost by fire of cost Rs. 350.	8	Section-II
20	What are the components of final account? Discuss about each in brief .	8	Section-II
21	What do you mean by the term "Management" explain its importance in the organizations? **(S)**		Section-III
22	Define the management and explain the process of management **(S)**	8	Section-III
23	Demonstrate the contribution of Taylor's scientific theory in Management. **(D)**	8	Section-III
24	Explain the Henry Fayol 14 principles in management **(M)**	8	Section-III
25	Discuss about the different schools of management thoughts. **(M)**	8	Section-III
26	Analyze the functions of Management. **(S)**	8	Section-III
27	Demonstrate various styles of leadership. **(D)**	8	Section-III
28	What are the Social Responsibilities of an organization, Give Few Examples.**(M)**	8	Section-III

29	Explain (a) Scalar Chain (b) Esperit De crops (c) Authority	3+2+3	Section-III
30	How the management incorporated into organizations?	8	Section-III
31	What is an organization structure? Explain its features. **(S)**	8	Section-IV
32	Describe the characteristics of line and staff organization? **(S)**	8	Section-IV
33	Write a note on (A) Project organization structure (B)Committee organization structure .**(M)**	4+4=8	Section-IV
34	Why a Group Dynamics important in an organization. **(S)**	8	Section-IV
35	Explain the various types of organization structures. .**(M)**	8	Section-IV
36	What is matrix organization structure discuss about is merits and demerits**. (D)**	8	Section-IV
37	How the groups will form in organization explain with various steps in group dynamics. **(D)**	8	Section-IV
38	Draw the functional organization structure and explain its merits and demerits. **(M)**	8	Section-IV
39	Describe the features of good organization structure.	8	Section-IV
40	What are the merits and Demerits of matrix organization structure ?	8	Section-IV
41	What is the concept of contemporary management? Define any three contemporary practices in brief. **(S)**	8	Section-V
42	Write a short note on the Total quality management (TQM). **(S)**	8	Section-V
43	How the CMM levels assign to the organizations. **(M)**	8	Section-V
44	Explain the key characteristics of six sigma With it levels. **(M)**	8	Section-V
45	Wrote a short note on (A) JIT (B) Balanced Score card. **(D)**	4+4=8	Section-V
46	Define the meaning of ERP and write the advantages and dis advantages of ERP. **(S)**	8	Section-V
47	Discuss about various modules of ERP and Innovations in ERP. **(M)**	8	Section-V
48	What are the different types of Bench marking techniques? **(D)**	8	Section-V
49	How the EPR support the organization . write your view on it.	8	Section-V
50	Write any two of contemporary management practices.	4+4	Section-V