AR18

CODE: 18CET101 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, November-2021

BUILDING MATERIALS

(Civil Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Write down the characteristic properties of a good stone.	6 M
	b)	What are the various tests for stones and explain them in detail.	6 M
		(OR)	
2.	a)	What are the various methods of Dressing of stones? Explain each of them briefly?	6 M
	b)	Write the all Safety precautions in Blasting at stone quarrying process.	6 M

UNIT-II

3.	a)	Describe the process of conversion of timber.	6 M
	b)	Compare softwoods with hardwoods.	6 M
		(OR)	
4.	a)	Discuss the properties of various ingredients of lime.	6 M
	b)	Explain the compressive strength and water absorption tests for bricks.	6 M

UNIT-III

5.	a)	What is fineness of cement? How it is determined in laboratory?	6 M
	b)	Explain about manufacturing process of cement with the help of flow diagram.	6 M
		(OR)	
6.	a)	What are the factors affecting the quality of tiles?	4 M
	b)	Write the salient points of light weight concrete comparing with ordinary concrete.	8 M

UNIT-IV

7.	a)	What are the factors that affect physical properties of steel.	4 M
	b)	Differentiate between ferrous metals and alloys?	8 M
		(OR)	
8.	a)	Explain in detail about classification and composition of glass?	6 M
	b)	Discuss the behaviour of concrete and steel.	6 M

UNIT-V

9.	a)	Classify different kinds of varnish and give brief description of each?	6 M
	b)	What are the causes of failure in oil paints & how can they be avoided?	6 M
		(OR)	
10.	a)	List various forms of Plastics with their properties and applications.	6 M
	b)	Explain the application of CFRP in concrete industry.	6 M

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AR18

CODE: 18EET101 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, November-2021

SWITCHING THEORY AND LOGIC DESIGN

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Convert the following to binary 6M
   i. $(125.62)_8$
   ii. $(8A9.B4)_{16}$
   b) i. Perform $(28)_{10} - (15)_{10}$ using 1's Complement representation. 6M
   ii. Perform $(15)_{10} - (28)_{10}$ using 2's Complement representation.

(OR)

2. a) i. Perform $(24)_{10} - (56)_{10}$ in BCD using 9's Complement representation. 6M
   ii. Find the 10's Complement of $(3497)_{BCD}$
   b) i. Express the decimal digits 0-9 in BCD, 2421 and Excess-3. 6M
   ii. Convert the number $(00111101.0101)_2$ to base 4.

UNIT-II

3. a) Prove $i. A(A+B) = A$ 6M
   ii. $A + \bar{A}B = A + B$
   $iii. A.(\bar{A} + B) = AB$
   b) Implement Boolean expression for Ex-NOR gate using NOR gates 6M

(OR)

4. a) Convert the following expressions in standard SOP form 6M
   i. f (A, B, C) = AC + AB + BC
   ii. f (A, B, C) = A + ABC
   b) Minimize the following expression using K-map 6M
   $Y = (\bar{A}B\bar{C}\bar{D} + \bar{A}B\bar{C}D + AB\bar{C}\bar{D} + AB\bar{C}D + A\bar{B}\bar{C}D + \bar{A}\bar{B}C\bar{D})$

UNIT-III

5. a) Design a full-adder with two half-adders and an OR gate 6M
   b) Draw and explain half subtractor using NAND gates 6M

(OR)

6. a) Draw the logic diagram of a 4-bit binary subtractor and briefly describe its functional operation 6M
   b) Design an 8- bit BCD adder using 4- bit binary adder 6M

UNIT-IV

7. a) Design and implement a two bit comparator using logic gates. 6M
   b) Implement the following logic function using MUX with three select inputs? 6M

$$f(a, b, c, d) = \bar{a} + bc\bar{d} + a\bar{d} + c$$

(OR)

8. a) What is decoder? Construct 3 X 8 decoder using logic gates and truth table. 6M
   b) Design a 1 : 8 de-multiplexer using two 1 : 4 de-multiplexers. 6M

UNIT-V

9. a) Draw the circuit of Master-slave JK flip- flop and explain its operation with the help of truth table. 6M
   b) Design a serial in and parallel out 4 bit shift register. 6M

(OR)

10. a) Design a 3-bit synchronous up/down counter using T flip- flop. 6M

    b) With neat diagram explain universal shift register. 6M

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AR18

CODE: 18EST104 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I Semester Supplementary Examinations, November-2021

ELEMENTS OF WORKSHOP TECHNOLOGY

(Mechanical Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Describe Manufacturing processes	4M
	b)	Explain the classification of the manufacturing process	8M
		(OR)	
2.	a)	List various workshop processes	6M
	b)	Describe (i) Hand forging (ii) Sheet metalwork.	6M

UNIT-II

3.	a)	Explain in brief with neat sketches the various types of measuring tools used in carpentry	6M
	b)	Discuss briefly with neat sketches the various types of cutting tools used in carpentry	6M
		(OR)	
4.	a)	Describe various Holding devices	4M
	b)	Explain the following carpentry processes in brief (i) Sawing (ii) Boring, (iii) Grooving (iv) Chiseling	8M

UNIT-III

5.	a)	Explain (i) Scraping (ii) Grinding (iii) Sawing (iv) Dieing	8M
	b)	Distinguish between drilling and reaming operations	4M
		(OR)	
6.	a)	Mention a list of marking tools and holding tools in fitting	6M
	b)	Explain tools used for marking and measuring in fitting.	6M

UNIT-IV

7.	a)	Describe the functions of (i) snips (ii) stakes	6M
	b)	Explain the sheet metal operations (i) shearing (ii) squeezing	6M
		(OR)	
8.	a)	Describe the function of (i) Hand hammers (ii) Mallets	6M
	b)	Distinguish bending and drawing	6M

UNIT-V

9.	a)	What is forging? Explain the advantages of forging process	6M
	b)	Explain (i) Swage (ii) Fullers (iii) Hot chisel	6M
		(OR)	
10.		Explain with neat sketches the following operations (i) Upsetting (ii) Drawing down (iii) Punching (iv) Drifting (v) Swaging(vi) Welding.	12M

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AR18

CODE: 18ECT102 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, November-2021

NETWORK THEORY

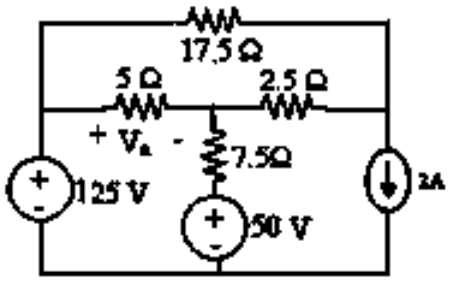
(Electronics and Communication Engineering)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

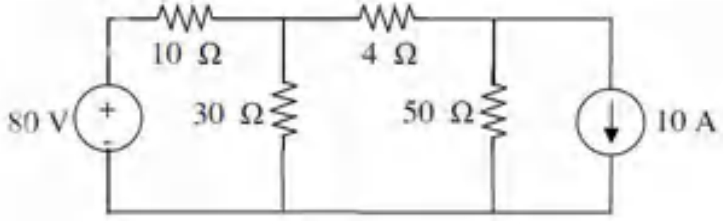
UNIT-I

1. a) What do you mean by an electric network and an electric circuit? 4M
   b) Find the value of Va for the following circuit using KVL 8M



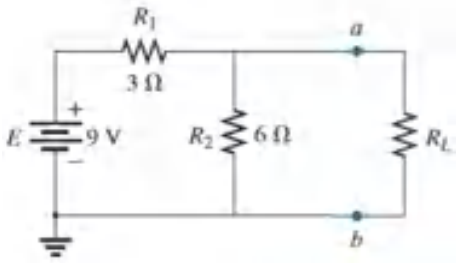
(OR)

2. a) State and explain Superposition theorem? 4M
   b) Verify Superposition theorem for 4Ω resistor for the following circuit 8M



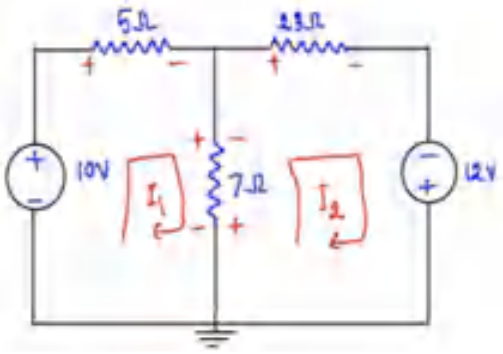
UNIT-II

3. a) State and explain milliman's theorem. 4M
   b) Find Norton's equivalent for the following circuit. 8M



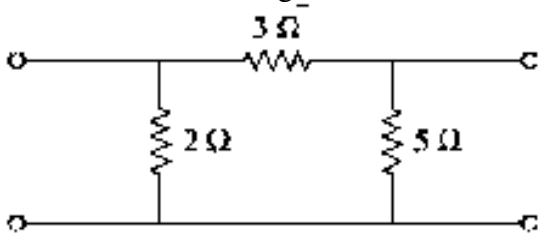
(OR)

4. a) State and explain Tellegens theorem. 4M
   b) Verify Tellegens theorem for the given circuit 8M



UNIT-III

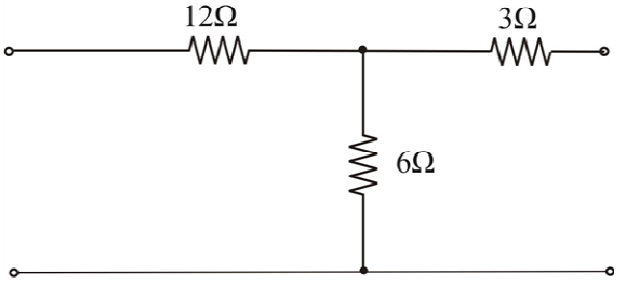
5. a) Find the Z- parameters for the following circuit. 6M



   b) Express ABCD parameters in terms of h parameters 6M

(OR)

6. Find the Z and Y parameters for the following circuit 12M



UNIT-IV

7. a) Find the resonant frequency,quality factor,band width for a parallel R,L,C resonant ciruit,which has R=12kΩ, L=180mH and C=0.5μF 6M
   b) Obtain the expression for resonant frequency for parallel RL-RC circuit. 6M

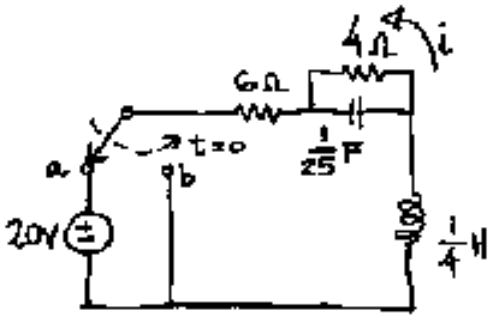
(OR)

8. A series RLC circuit has R=10Ω, L=0.5H and C=40μF. The applied voltage is 100V. 12M

Find (a) Resonant frequency & Quality factor of a coil (b) Bandwidth (c) Upper and lower Half power frequencies (d) Current at resonance & current at half power points (e) Voltage across inductance & voltage across capacitance at resonance

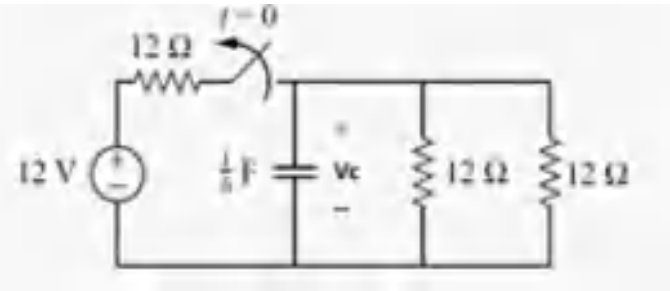
UNIT-V

9. The switch is in 'a' for long time.At t=0,the switch moves to 'b'.For t>0,determine the current i(t) in 4ohm resistor at the top with the direction indicated. 12M



(OR)

10. The switch has been closed for long time .At t=0,the switch is opened, what is the voltage across the capacitor Vc(t) 12M



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AR18

CODE: 18CST101 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, November-2021

DATA STRUCTURES AND ALGORITHMS

(Common to CSE, IT Branches)

Time: 3 Hours **Max Marks: 60**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	What is space complexity? Illustrate with an example for fixed and variable part in space complexity?	6M
	b)	Discuss the time complexity analysis with an example.	6M
		(OR)	
2.	a)	What are the features of efficient algorithm? Explain with an example.	6M
	b)	Differentiate between Bigoh and omega notation with example.	6M

UNIT-II

3.	a)	Explain merge sort algorithm.	6M
	b)	Write a program to sort the elements using quick sort.	6M
		(OR)	
4.	a)	Explain linear Search algorithm in detail.	4M
	b)	Describe insertion sort algorithm and trace the steps of insertion sort for sorting the list- 12, 19, 33, 26, 29, 35, 22, 37. Find the total number of comparisons made.	8M

UNIT-III

5.	a)	Discuss the role of stacks in executing recursive procedures using factorial program.	6M
	b)	Give the structure of Queue Data Structure. Explain the operations in it.	6M
		(OR)	
6.	a)	What is a priority queue? Explain different methods of implementing them.	6M
	b)	Convert given Infix expression: (a + b * c ^ d) * (e + f / g) to Postfix expression using Stack and show the details of Stack at each step of conversion. (Note: ^ indicates exponent operator)	6M

UNIT-IV

7.	a)	Explain about insertion and deletion operations on single linked lists. Write pseudo code for the same.	6M
	b)	Show how to reverse a single linked list.	6M
		(OR)	
8.	a)	Write an algorithm to traverse through all the elements of a singly linked list.	6M
	b)	List various operations of linked lists and explain how to search an element in a doubly linked list.	6M

UNIT-V

9.		Write in-order, pre-order and post-order traversal of a binary tree. Create a binary tree for the following elements 3,45,12,23,13,1,67,34 and traverse through the tree using in-order, pre-order and post-order traversals.	12M
		(OR)	
10.		What is an AVL tree? Explain the need for rotation of AVL trees. Construct an AVL Tree for the list 8,9,11,6,5,7,10 by using successive insertion. Illustrate the steps Clearly.	12M

AR16

CODE: 16CE1001 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech I / I B.Tech II Semester Supplementary Examinations, November-2021

BUILDING MATERIALS AND CONSTRUCTION

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a	Briefly describe the application of Ceramic Products in building construction.	8
	b	What are the uses of various types of bricks?	6
		(OR)	
2.	a	Describe the defects caused in timber due to fungi	6
	b	What is meant by decay of timber? What are its causes	8

UNIT-II

3.		Distinguish between metals and alloys. How application wise they differ in the construction	14
		(OR)	
4.	a	How glass is classified?	4
	b	Give the chemical formula for each category of glass?	5
	c	What are the properties of good glass?	5

UNIT-III

5.	a	Why is artificial seasoning adopted? Describe its various methods	6
	b	What are the Water Proofing and Damp Proofing Material? Give their application in construction industry	8
		(OR)	
6.	a	Discuss the various tests used to determine the properties of stones	6
	b	With the help of neat sketches describe the process of burning bricks in intermittent and continuous kilns	8

UNIT-IV

7.	a	Define foundation and mention its objectives.	6
	b	Discuss the various types of prefabricated elements and their role in construction.	8
		(OR)	
8.	a	Explain the concept "Ferro Cement Construction".	6
	b	Draw a neat sketch of spiral staircase and mention its important features	8

UNIT-V

9.	a	Mention the usual defects which are found in painting work	7
	b	What do you mean by paints? What are the ingredients of paint? Explain in detail	7
		(OR)	
10.	a	Distinguish between painting and varnishing	6
	b	Explain the following with suitable applications i) Termite proofing ii) Scaffolding	8

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AR16

CODE: 16EC1001 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, November-2021

ELECTRONIC DEVICES

(Electronic and Communication Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

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UNIT-I

1. Explain the construction and operation of CRT and CRO. 14M

(OR)

2. a) Explain the motion of a charged particle between two parallel electric plates. 8M
   b) Discuss any three applications of cathode ray oscilloscope. 6M

UNIT-II

3. a) What are extrinsic semiconductors? Explain the formation of N-type semiconductor with a neat sketch. 8M
   b) Discuss about the expression for conductivity of a semiconductor and find the intrinsic conductivity for germanium. Assume $n_i = 2.5x10^{13}cm^{-3}$, μ_n=3800 and μ_p=1800cm^2/V-s respectively. 6M

(OR)

4. a) Explain intrinsic and extrinsic semi conductors 6M
   b) Distinguish between metals, semiconductors and insulators based on energy band diagram. 8M

UNIT-III

5. a) Explain the forward and reverse bias characteristics of PN junction diode. 10M

   b) Derive the expression for diffusion capacitance in a PN junction diode. 4M

(OR)

6. a) What is the difference between avalanche and Zener breakdown? Explain the application of Zener diode. 8M
   b) Discuss the characteristics of tunnel diode. 6M

UNIT-IV

7. Explain the input and output characteristics of bipolar junction transistor in CB and CE configuration. 14M

(OR)

8. a) Explain the VI characteristics of photo transistor. 8M
   b) Compare CE and CB and CC configurations of BJT. 6M

UNIT-V

9. a) Explain the characteristics of FET with neat diagrams. 8M
   b) Derive the relation between FET parameters. 6M

(OR)

10. a) Explain the characteristics of silicon controlled rectifier with a neat sketch. 8M
    b) Compare bipolar junction transistor and junction field effect transistor. 6M

AR16

CODE: 16EC1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, November-2021

SWITCHING THEORY AND LOGIC DESIGN

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a). i. Represent $(101010101)_2$ in 1's complement format and 2's complement format. [8M]
   ii. Represent $(954)_{10}$ in 9's complement format.
   iii. Represent $(8)_{10}$ in Excess -3 Format.
   b). The message 1001001 coded in the 7-bit hamming code is transmitted through a noisy channel, Decode the message assuming the single error occurred in code word with odd parity. [6M]

(OR)

2. a). Convert the following [8M]
   i. $(FACE)_{16} = (\quad)_2$
   ii. $(18.76)_{10} = (\quad)8$
   iii. $(984)_8 = (\quad)_{16}$
   iv. $(100011)_2 = (\quad)_8$
   b). With an example, explain about Self Complementing Codes? [6M]

UNIT-II

3. a). Prove that [8M]
   i. y'z'+w'x'z'+w'xyz'+wyz'=z'
   ii. AB+(AC)'+AB'C(AB+C)=1
   b). Obtain the Dual and Complement of the following Boolean expression. [6M]
   A(BC+A'D) +B'(A'+C)

(OR)

4. a). Expand the Boolean function F=A'+B'C as minterms and maxterms. [7M]
   b). Realize the Boolean expression Y=AB+CD using NOR gate. [7M]

UNIT-III

5. Design a BCD to Gray code converter. [14M]

(OR)

6. a). Minimize the following Boolean expression using Tabular method. [8M]
F (A, B, C, D) = $\sum m(0,5,7,8,9,10,11,14,15)$
b). Minimize the following function using K-Map. [6M]
F (A, B, C, D) = $\sum m(0,1,2,3,8,9,10,11)$

UNIT-IV

7. a). Explain the working of BCD adder circuit? [7M]
b). Explain the working of 8x3 Encoder using logic gates and functional table? [7M]

(OR)

8. a). Implement 4x16 decoder using 3x8 decoder. [8M]
b). Explain the working 1x4 demultiplexer using logic gates and functional table? [6M]

UNIT-V

9. a). Explain the working of 4-bit Ring Counter with the help of logic diagram? [7M]
b). Convert JK Flip-flop to T Flip-Flop? [7M]

(OR)

10. a). Design Mod-12 Counter using T Flip-Flop? [8M]
b). Explain the working of SR Flip-Flop? [6M]

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AR16

CODE: 16CS1002 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, November-2021

DATA STRUCTURES

(Common to CSE, IT Branches)

Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

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UNIT-I

1.	a	Define Algorithm. Explain time complexity Analysis for the algorithm of finding the greatest of three numbers	7M
	b	Define recursion. Write recursive algorithm for binary search	7M
		(OR)	
2.	a	Define Data Structure. Give the differences between linear and non-linear data structures	7M
	b	Give the Detailed hierarchical list of classification of Data Structures	7M

UNIT-II

3.	a	Define the process of Searching. Write the algorithm for binary search.	7M
	b	Explain Quick sort for the example data given : 23, 11, 56, 10, 18, 20	7M
		(OR)	
4.	a	Apply Insertion Sort, Selection Sort for the given data 23, 11, 56, 10, 18, 20	7M
	b	Define linear search. Write the algorithm for linear search	7M

UNIT-III

5.	a	Draw the array representation of Stack data structure and explain stack operations	7M
	b	Explain the application of Stack : Evaluation of Postfix expressions	7M
		(OR)	
6.	a	Define linear Queue. Explain the operations of Queue.	7M
	b	Write about any application of Queue	7M

UNIT-IV

7.	a	Define linked list. Draw the node structure used for doubly linked list. Explain about the three types of linked lists	7M
	b	Draw the structure for Singly linked list. Explain any two insert cases through examples	7M
		(OR)	
8.	a	Define Circular linked list. Explain insert operation on a circular list	7M
	b	Write the algorithm for Singly linked list mid node deletion	7M

UNIT-V

9.	a	Define Binary tree. Give the array representation and linked list representations for a sample binary tree example	7M
	b	Draw the binary tree from the in-order and post-order traversals given as inorder sequence: D B E A F C Preorder sequence: A B D E C F	7M
		(OR)	
10.	a	Define graph. Explain traversal DFS for a sample graph	7M
	b	Explain graph representation techniques.	7M

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Code: 13BS1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI (AUTONOMOUS)
I B.Tech I / I B.Tech II Semester Supplementary Examinations, November-2021
ENGINEERING MATHEMATICS-II
(Common to All Branches)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) If x_0 and x_1 are 2 and 3 then by the method of false position, x_2 of $x^3 - 2x - 5 = 0$ is given by.

   b) If $y = a + bx + cx^2$ then by the method of least squares, the third normal equation is given by.

   c) Relation between Δ and E.

   d) The value of $\Delta^{10}(1-x)(1-2x^2)(1-3x^5)(1-4x^4)$ if $h = 2$.

   e) States that Gauss backward interpolation formula.

   f) Write the Picard's successive approximation formula for $y^1 = f(x,y),\ y(x_0) = y_0$.

   g) Write the Laplace transform of Dirac's delta function.

   h) $L^{-1}\left\{\frac{1}{s^2 - a^2}\right\}$

   i) Write the first order partial differential equation by eliminating a and b from the relation $z = (x + a)(y + b)$.

   j) The complete solution of the partial differential equation $z = px + qy + \sqrt{1 + p^2 + q^2}$ is given by.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a Using bisection method ,find an approximate root of the equation $x^3 - x^2 - 1 = 0$ which lies between 1 and 2. Carryout bisection up to the eighth stage of approximation. 6M

   b Using Newton-Raphson method, find an approximate root of the equation $e^x - 3x = 0$ near $x = 0.5$. 6M

(OR)

3. a Find by Iteration method, the root of the equation $2x - log_{10}x = 7$ that is near $x = 3.8$. 6M

   b Fit a curve of the form $a + bx$ to the following data by the method of least squares 6M

x	27	45	41	19	3	39	19	49	15	31
y	57	64	80	46	62	72	52	77	57	68

UNIT-II

4. a Using Newton backward interpolation formula find $f(0.53)$ from the following table of values of $y = f(x)$ 6M

x	0.3	0.4	0.5	0.6
y	0.6179	0.6554	0.6915	0.7257

b Find the interpolating polynomial for the data given in the following table 6M

x	0	1	4	5
y	4	3	24	39

(OR)

5. a Find $f^1(1.72)$ by using the table given below 6M

x	1.72	1.73	1.74	1.75	1.76
$f(x)$	0.17907	0.17728	0.17552	0.17377	0.17204

b Evaluate $\int_2^{10} \frac{1}{1+x} dx$ by using Simpson's $\frac{1}{3}$ rule, take $h = 1$. 6M

UNIT-III

6. a Using the Taylor's series method, find $y(0.1)$ for $y^1 - x^2y - 1, y(0) = 1.$ 6M

b Using R-K method of 2nd order, compute $y(2.5)$ from $y^1 = \frac{x+y}{x}, y(2) = 2,$ taking $h = 0.25.$ 6M

(OR)

7. a Using Euler's modified method, solve the initial value problem $y^1 = \log(x + y), y(1) = 2$ at the point $x = 1.2,$ take $h = 0.2$ and carry out two modifications. 6M

b Using R-K method of 4th order, solve $y^1 = \frac{y-x}{y+x}$, y(0)=1 at the point $x = 0.1.$ 6M

UNIT-IV

8. a Find $L\left\{\frac{\cos at - \cos bt}{t} \mid t \sin at\right\}$ b Find $L^{-1}\left\{\tan^{-1}\frac{2}{s^2}\right\}$ 6M

(OR)

9. a Find $L^{-1}\left\{\frac{(s+2)^2}{(s^2+4s+8)^2}\right\}$ b Solve $x^{11} - 2x^1 + x = e^t$ with $x = 2,$ $x^1 = -1$ at $t = 0.$ 6M

UNIT-V

10. a Form the partial differential equation by eliminating the arbitrary functions f and g from the relation $z = f(y + 2x) + g(y - 3x).$ 6M

b Solve $(x^2 - yz)p + (y^2 - zx)q = (z^2 - xy)$ 6M

(OR)

11. a $q^2 = p^2z^2(1 - p^2)$ b Solve $x^2z_{xy} + 3y^2z = 0$ by using the method of separation of variables. 6M+6M