AR18

CODE: 18EST101 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

BASIC ELECTRICAL ENGINEERING

(Common to CE, 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) Define the following terms 4M
   i) Unilateral element
   ii) Distributed network
   iii) Passive network
   iv) Independent source

   b) State and explain Kirchhoff's laws 8M

(OR)

2. a) Use series and parallel reduction technique and find the Power delivered by the source for the figure-1. 3M

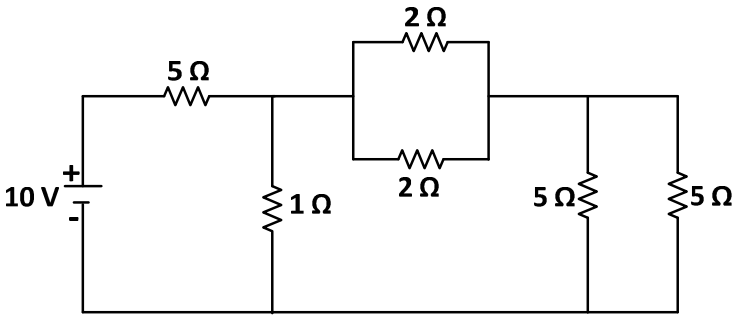

Fig-1

   b) Compute the equivalent resistance across AB for the network shown in fig2. 9M

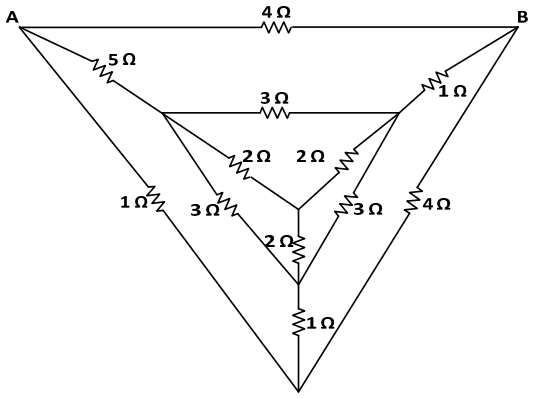

Fig-2

UNIT-II

3. a) A series RC circuit with R = 120 Ωand C = 3.3 μF is connected to a 12 V RMS, 1 kHz supply. Determine the circuit current, the resistor voltage, the capacitor voltage and the phase angle of the current with respect to the supply voltage. 6M

   b) Compute the Form Factor of the waveform shown in fig-3. 6M

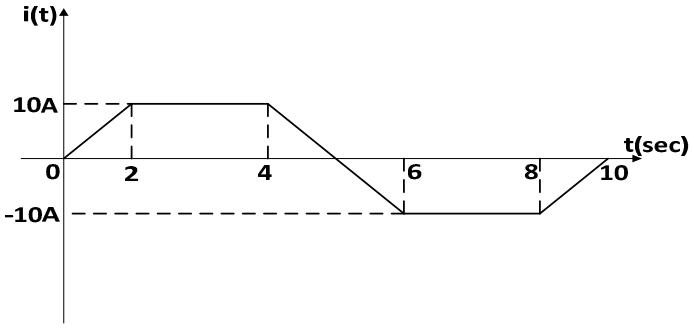

Fig-3

(OR)

4. Derive the expression for average and RMS value of sine wave. 12M

UNIT-III

5. a) Explain the construction of a DC machine with a neat sketch. 9M

   b) Discuss various losses of DC machine. 3M

(OR)

6. a) Explain the working of 3-point starter with a neat sketch. 7M

   b) Explain the various speed control methods of DC Motors. 5M

UNIT-IV

7. a) Derive the emf equation of a transformer. 3M

   b) Explain the various tests of the transformer. 9M

(OR)

8. a) Explain the principle of operation of transformer. 7M

   b) A single phase 50 Hz transformer has 100 turns on the primary and 400 turns on the secondary winding. The net cross-sectional area of core is 250 cm^2. If the primary winding is connected to a 230 V 50 Hz supply, determine 5M

      i. The EMF induced in the secondary winding
      ii. The maximum value of flux density in the core.

UNIT-V

9. a) Explain the principle of operation of induction motor 6M

   b) Draw the torque-slip characteristics of induction motor 6M

(OR)

10. Derive expression for torque under running condition for an induction motor 12M

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AR18

CODE: 18EET102 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

ELECTRIC CIRCUIT THEORY

(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) Explain the voltage current relationship in R ,L and C 5M
   b) Explain the difference between practical sources and ideal sources. 7M

(OR)

2. a) Find the value of current I_1 in figure 1. 5M

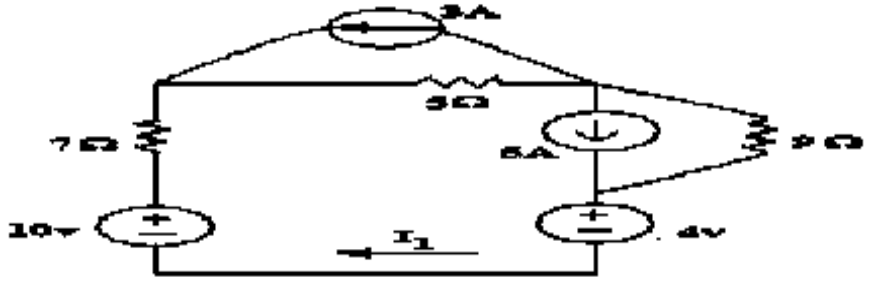

Fig.1

   b) For the circuit shown in figure 2, find the current through 20Ω resistor using mesh analysis. 7M

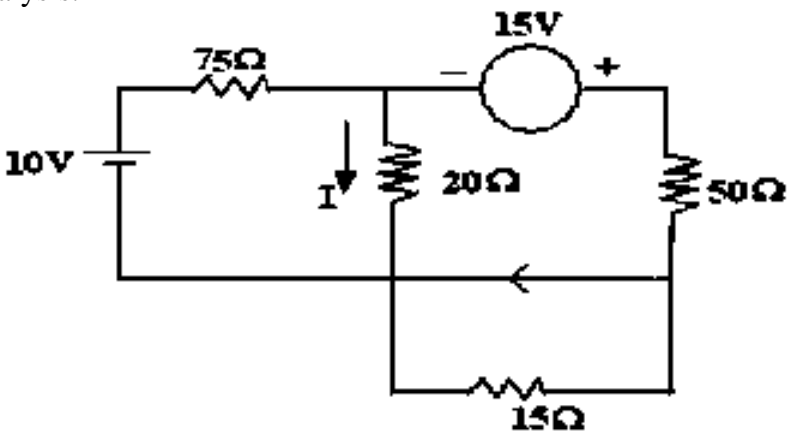

Fig.2

UNIT-II

3. a) Explain resonance in series RLC circuit 6M
   b) A series RLC circuit with R = 10Ω, L = 318.3mH, C = 31.83μF is excited from a 10V, 50Hz(ω = 314 rad/s) source. Determine the rms values of voltage across 6M
      i. Resistance
      ii. inductance
      iii. capacitance

(OR)

4. a) A series RLC circuit has the values: R =100Ω, L = 0.02H, C = 0.02μF. Calculate frequency of resonance. A variable frequency sinusoidal voltage of value 50V is applied to the circuit. Find the frequency at which voltage across L and C is the maximum. Also calculate voltage across L and C at frequency of resonance. Find the maximum current in the circuit. 12M

UNIT-III

5. a) Explain about the reciprocity theorem. 5M
   b) Obtain the voltages V_1, V_2 and V_3 using superposition theorem. 7M

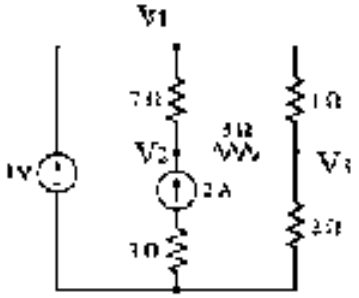

Fig.3

(OR)

6. Explain the Super position theorem with suitable example. 12M

UNIT-IV

7 State and Explain the maximum power transfer theorem 12M

(OR)

8. a) State and explain Telligen's theorem. 5M
   b) In a network shown below, 5 Ω resistor is changed to 8 Ω. Determine the resulting change in current through (3+j4) Ω impedance using Compensation theorem. 7M

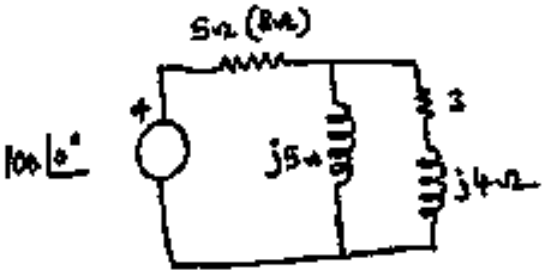

fig.4

UNIT-V

9. Derive the relation between line and phase voltages in currents in star connection. 12M

(OR)

10. a) Explain, with a neat sketch, how a three-phase power is measured in delta connected load using two-watt meters? 6M
    b) A four-wire star-star circuit has Van = 120□120^0 , Vbn = 120 □0^0 Vcn = 120 □– 120^0 V. If the impedances are Zan = 20□60^0 , Zbn= 30□□0^0 and Zcn = 40 □30^0 Ω, find the current in the neutral line. 6M

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AR18

CODE: 18EST105 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

BASIC ELECTRONICS

(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)	Determine the value of forward current in the case of a PN junction diode, with I_0=10μA and V_f = 0.8V at T=300K. Assume silicon diode.	6M
	b)	Explain the formation of depletion region in an open circuited pn-junction with neat sketches.	6M
		(OR)	
2.	a)	Draw and explain forward and reveres bias characteristics of a diode.	6M
	b)	Draw the circuit diagram of a half wave rectifier.	6M

UNIT-II

3.	a)	Compare the differences between BJT and FET.	5M
	b)	Explain the operation of CE (Common Emitter) Configuration of BJT.	7M
		(OR)	
4.	a)	Draw the structure of N-channel JFET and explain its operation.	7M
	b)	A FET has a drain current of 4mA. If I_{dss} = 8mA and $V_{gs(off)}$ = -6V, find the values of V_p and V_{gs}.	5M

UNIT-III

5.	a)	Draw and explain small signal common emitter amplifier.	7M
	b)	Explain the importance of bypass and coupling capacitors.	5M
		(OR)	
6.	a)	Derive the voltage gain and input resistance for emitter follower using h-parameters.	7M
	b)	Explain the different types of distortion in amplifiers.	5M

UNIT-IV

7.	a)	Define feedback concept.	4M
	b)	Write about RC phase shift oscillator with neat sketch.	8M
		(OR)	
8.	a)	Derive the expression for the frequency of oscillation for Hartley oscillator.	6M
	b)	For the voltage series feedback amplifier, derive the expression for gain, input resistance and output resistance.	6M

UNIT-V

9.	a)	Define CMRR and also explain block diagram differential amplifier.	8M
	b)	Explain SLEW, PSRR.	4M
		(OR)	
10.	a)	Define and explain the following terms refer to an op-amp: i) Input bias current ii) Input offset current iii) Input offset voltage iv) Thermal drift	7M
	b)	Sketch the level shifting circuit used in op-amp and explain the working.	5M

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AR18

CODE: 18ECT103 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

ELECTRONIC CIRCUITS

(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) Explain the principle of operation of Half wave rectifier with neat circuit diagram and waveforms [6M]
   b) Derive the following parameters of Half wave rectifier [6M]
   i) V_{dc} ii) I_{dc} iii) I_{rms}

(OR)

2. a) Explain the principle of operation of Full wave rectifier with neat circuit diagram and waveforms [6M]
   b) Derive the following parameters of Full wave rectifier [6M]
   i) V_{dc} ii) I_{dc} iii) I_{rms}

UNIT-II

3. a) Explain the operation of L section filter [6M]
   b) Explain how Zener diode acts as voltage regulator [6M]

(OR)

4. Explain the operation of capacitor filter and derive the ripple factor. [12M]

UNIT-III

5. a) Explain thermal runaway and stabilisation techniques [6M]
   b) Draw a fixed bias circuit and explain it. [6M]

(OR)

6. Explain the different biasing compensation techniques. [12M]

UNIT-IV

7. Determine the h-parameters from input and output characteristics [12M]

(OR)

8. Explain the analysis of transistor amplifier circuit with the help of h-parameters [12M]

UNIT-V

9. Explain the general characteristics of negative feedback amplifier [12M]

(OR)

10. a) Explain about the voltage shunt feedback amplifier [6M]
    b) Explain about the current series feedback amplifier [6M]

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AR16

CODE: 16EE1004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Supplementary Examinations, February-2021

BASIC ELECTRICAL &ELECTRONICS ENGINEERING
(Common to CE & ME branches)

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

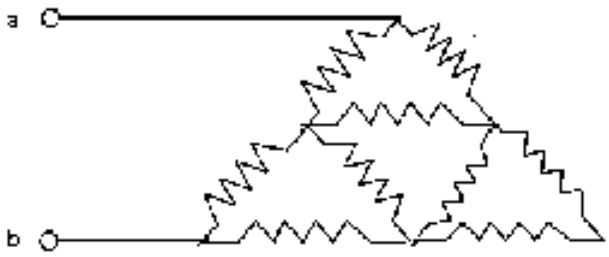
Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

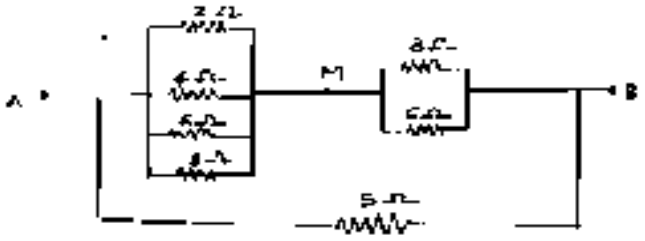
1. a) Define the following terms 4M
   i) Unilateral element
   ii) Distributed network
   iii) Passive network
   iv) Independent source
   b) State and explain Kirchhoff's laws. 10M

(OR)

2. a) Find the equivalent resistance R_{ab} for the circuit shown below. All the resistor values are 1Ω 7M



   b) If 20 V be applied across AB shown below , calculate the total current, the power dissipated in 4 Ω resistor and 3 Ω resistor 7M



UNIT-II

3. a) Derive the EMF equation of A DC machine 8M
   b) Discuss various losses of DC machine. 6M

(OR)

4.	a)	Describe how a DC shunt generator develops EMF with a neat sketch and equations	7M
	b)	What is the necessity of starter and describe how 3 point starter operates with a neat sketch	7M

UNIT-III

5.	a)	What are the different losses found in a transformer?	4M
	b)	Explain transformer OC and SC.	10M
		(OR)	
6.	a)	Describe the operation of three phase induction motor	7M
	b)	Explain the torque slip characteristics of three phase induction motor	7M

UNIT-IV

7.	a)	Derive the EMF equation of alternator	7M
	b)	Describe various types of alternators in detail	7M
		(OR)	
8.	a)	Describe the PMMC type of instrument in detail with a neat sketch	7M
	b)	Describe the MI type of instrument in detail with a neat sketch	7M

UNIT-V

9.	a)	Explain the full wave rectifier in detail	7M
	b)	Explain the half wave rectifier in detail	7M
		(OR)	
10.	a)	Explain the CB configuration with various characteristics and sketches	7M
	b)	Explain the dc load line of a transistor in detail	7M

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AR16

CODE: 16EC1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, February-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)	Find the 2's complement of the following binary numbers. i. 11111 ii. 000000 iii. 1010101010	**6M**
	(b)	Draw the block diagram of 2 bit odd parity generator and write its application.	**8M**
		(OR)	
2	(a)	Convert the following gray codes in to binary codes. i. 11111111 ii. 0000 iii. 01101010	**6M**
	(b)	Calculate the number of Hamming bits required to correct single error for the message sequence {1001}. Also find the Hamming codeword using even parity.	**8M**

UNIT-II

3	(a)	Design Ex-OR gate using only NOR gates.	**6M**
	(b)	Prove that $BC + A\bar{B} + AC = BC + A\bar{B}$ using Boolean algebra.	**8M**
		(OR)	
4	(a)	Prove that $A + \bar{A}B = A + B$	**6M**
	(b)	Convert the following Boolean expression in to standard POS form $Y = (A + B).(A + \bar{C})$	**8M**

UNIT-III

5	(a)	Simplify the following POS using K-map method. $Y = \pi(2,4,5,6)$	**6M**
	(b)	A Boolean expression is represented in SOP form as $Y = \sum(2,3,5,6,11)$ Find the simplified Boolean expression in POS form	**8M**
		(OR)	

6		Simplify the following SOP using K-map method. $Y = \sum(2,3,5,6,11,12,16) + \sum d(17,18,19,20,21,22)$	**14M**

UNIT-IV

7	(a)	Design 4 bit full adder and very the result for the input $D_0 = 1$, $D_1 = 1$, $D_2 = 0$, $D_3 = 1$.	**6M**
	(b)	Design BCD to Excess-3 converter and explain its operation.	**8M**
		(OR)	
8	(a)	Design 1X8 de-multiplexor using two 1X4 de-multiplexors.	**6M**
	(b)	Design BCD to Decimal decoder and explain its operation.	**8M**

UNIT-V

9	(a)	Explain how JK flip-flop can be converted in to T flip-flop.	**6M**
	(b)	Design MOD – 8 ring counter and explain its operation using truth table.	**8M**
		(OR)	
10	(a)	What are the differences between combinational circuits and sequential circuits.	**6M**
	(b)	Design MOD – 8 ripple counter and explain its operation using truth table.	**8M**

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AR16

CODE: 16EC1001 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

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

ELECTRONIC DEVICES

(Electronics & 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

UNIT-I

1. a) Explain CRT with neat sketch. 7M
   b) Explain CRO block diagram. 7M

(OR)

2. a) Compare Electric and Magnetic Deflection systems. 8M
   b) The electron beam in a CRT is displaced vertically by a magnetic field of flux density 2×10^{-4} Wb/m2. The length of the magnetic field along the tube axis is the same as that of the electrostatic deflection plates. The fine anode voltage is 800V. Calculate the voltage which should be applied to the Y-deflection plates 1cm apart, to return the spot back to the centre of the screen. 6M

UNIT-II

3. a) Explain energy band diagrams of semiconductors, conductors, insulators. 8M
   b) Explain intrinsic and extrinsic semiconductors. 6M

(OR)

4. Derive an expression for the Continuity Equation. Write the modified equations of the continuity equation for the following (i) concentration independent of distance with zero electric field (ii) concentration independent of time with zero electric field(iii) concentration varies sinusoidally with time and with zero electric field 14M

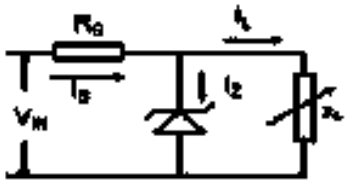
UNIT-III

5. a) Explain diode V-I characteristics. 8M
   b) Explain Zener diode characteristics. 6M

(OR)

6. a) Explain in detail the Zener an Avalanche breakdown mechanisms in reverse biased PN junction diodes. Draw the V-I characteristics of a Zener diode and explain how it can be used as a voltage regulator. 8M

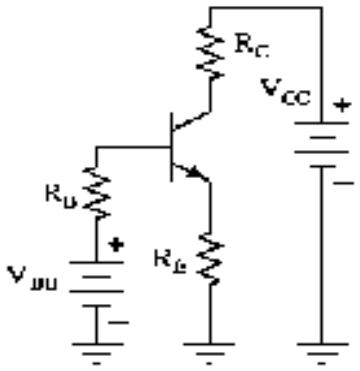
   b) For the Zener voltage regulator shown Determine the range of RL and IL that gives the stabilizer voltage 10V. (Given Vi=40V RS=1KΩ,VZ=10V IZmax=24mA IZmin=5mA) 6M



UNIT-IV

7. a) Sketch the profiles of the minority and majority carrier currents in the base region of an NPN transistor under active condition. Explain the transistor operation with the help of these profiles. 8M

   b) (i)Consider the transistor circuit below. For V_{CC}=10V, V_{BB}=5V,V_{BE}=0.7V R_B=10KΩ,R_C=500Ω, R_E=100Ω and β=100. Calculate I_B,I_C,I_E,V_{CB} and V_{CE}. 6M



   (ii)If V_{BB} is varied while maintaining other parameters unchanged in (i) what is the min V_{BB} required to drive the transistor into saturation? Given $V_{CE(Sat)}$=0.3V

(OR)

8. a) Explain the input and output characteristics of a transistor in CB configuration. 7M

   b) Explain the input and output characteristics of a transistor in CE configuration. 7M

UNIT-V

9. a) Draw the schematic diagram and transfer characteristics of n-channel and p-channel depletion type MOSFET 6M

   b) Explain the different regions of output characteristics of JFET 8M

(OR)

10. Explain the construction of operation characteristics and applications of SCR 14M

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AR16

CODE: 16CS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, February-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 in one place only

UNIT-I

1.	a	Define recursion and implement Towers of Hanoi problem using Recursion.	**7**
	b	Define an algorithm. Describe commonly used asymptotic notations and give their significance.	**7**

(OR)

2.	a	Define and explain the operations and types of Data structure	**7**
	b	Explain algorithm analysis and complexity in detail	**7**

UNIT-II

3.	a	Explain about the Selection Sort with an example.	**7**
	b	Write an algorithm for Binary search with suitable example	**7**

(OR)

4.	a	Write an algorithm for sorting the given elements using quick sort	**7**
	b	Write a algorithm for linear search.	**7**

UNIT-III

5.	a	What is a stack? Explain overheads caused by stack in recursion with a suitable example.	**7**
	b	Write the algorithm for evaluating a postfix expression using stack. Evaluate the following postfix notation 5 6 2 + * 8 4 / -	**7**

(OR)

6.	a	Explain various operations that are performed on queue with suitable algorithms.	10
	b	Write the applications of queues.	4

UNIT-IV

7.		Explain different methods of insertion and deletion operations on single linked lists? Write the pseudo code for the same?	14

(OR)

8.	a	What are the advantages and disadvantages of doubly linked list	7
	b	Swap two adjacent elements by adjusting only the pointers using doubly linked lists.	7

UNIT-V

9.	a	What is a Binary search tree? Discuss.	7
	b	Write an algorithm for insert an element into a binary search tree.	7

(OR)

10.	a	What is a Graph? How graphs can be represented? Discuss.	7
	b	Write an algorithm for BFS with example	7

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AR13

Code: 13BS1002 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI (AUTONOMOUS)
I B.Tech II Semester Supplementary Examinations, February-2021

ENGINEERING MATHEMATICS-II
(Common to EEE & ECE)

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 $\Delta^{10}(1-x)(1-2x^2)(1-3x^5)(1-4x^6)$ 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) $L^{-1}\left\{\dfrac{1}{s^2 - a^2}\right\}$

   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. 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.

(OR)

3 Fit a curve of the form y = $a + bx$ to the following data by the method of least squares

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 $y = f(x)$

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

x	0	1	4	5
y	4	3	24	39

(OR)

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

UNIT-III

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

(OR)

7. 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.

UNIT-IV

8. a Find $L\left\{\frac{\cos at - \cos bt}{t} + t \sin at\right\}$

b Find $L^{-1}\left\{tan^{-1}\frac{2}{s^2}\right\}$

(OR)

9. Solve $x^{11} - 2x^1 + x = e^t$ with $x = 2$, $x^1 = -1$ at $t = 0$.

UNIT-V

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

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

(OR)

11. Solve $x^2 z_{xy} + 3y^2 z = 0$ by using the method of separation of variables.

AR13

CODE: 13EE1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

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

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE & ME branches)

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

PART-A

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

1. a) List the formulae for current and voltage in an inductor.
   b) Define current.
   c) List the types of DC generator.
   d) Recall emf equation of a DC generator.
   e) What is the rating of transformer?
   f) Define slip.
   g) Define recording instrument.
   h) Define damping torque.
   i) List two applications of diode.
   j) Draw the symbol of diode and transistor.

PART-B

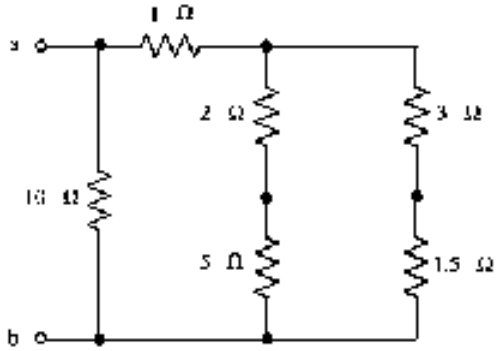
Answer one question from each unit **[5x12=60M]**

UNIT-I

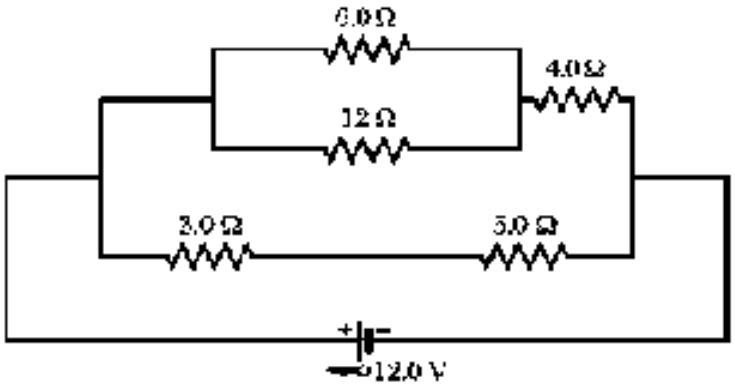
2. a) Define the following terms **4M**
      i) Unilateral element
      ii) Distributed network
      iii) Passive network
      iv) Independent source
   b) State and explain Kirchhoff's laws. **8M**

(OR)

3. a) If the circuit shown is fed by a voltage source of 12 V between terminals a and b, find the total current delivered by the source, current through 1.5 ohm resistor, voltage drop across 2 ohm resistor, power absorbed by 5 ohm resistor and energy dissipated by 1 ohm resistor in 1 minute. **6M**



b) In the circuit shown, find the current delivered by the source and energy absorbed by the circuit in 5 minutes. **6M**



UNIT-II

4. Explain the construction of a DC machine with a neat sketch. **12M**

(OR)

5. Explain the various types of DC Generators. **12M**

UNIT-III

6. a) Explain the principle of operation of single phase transformer **6M**
   b) Discuss various losses of transformer. **6M**

(OR)

7. a) Explain the principle of operation of induction motor **6M**
   b) Derive the emf equation of a transformer. **6M**

UNIT-IV

8. Explain the working of PMMC instrument **12M**

(OR)

9. Explain the working of PMMI instrument **12M**

UNIT-V

10. a) Explain the working of PN junction diode. **6M**
    b) Explain the working of a half wave rectifier. **6M**

(OR)

11. a) Explain how transistor acts as an amplifier. **6M**
    b) Explain the working of a full wave rectifier. **6M**

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AR13

CODE: 13CS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

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

DATA STRUCTURES
(Common to CSE and IT)

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

PART-A

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

1. a) What is a difference between linear recursion and binary recursion?
   b) What are the measures for the efficiency of an algorithm?
   c) Define link list?
   d) What is the stack overflow condition?
   e) What is the average case in linear search?
   f) What is pivot element?
   g) Give the difference between binary tree and BST.
   h) What is height of a tree?
   i) Which data structure is used for BFS?
   j) What is undirected graph?

PART-B

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

UNIT-I

2.	a	Define and explain the operations and types of Data structure	6
	b	Explain algorithm analysis and complexity in detail	6
		(OR)	
3.	a	What are asymptotic notations?	4
	b	Write an algorithm to find Prefix sum of a list X[N] is defined as the Sequence s of n elements, with sk = x1 + ... + xk. For example, x = [1, 4, 3, 5, 6, 7, 0, 1] s = [1, 5, 8, 13, 19, 26, 26, 27]	8

UNIT-II

4.	a	Explain various operations that are performed on queue with suitable algorithms.	4
	b	Write the applications of queues.	8
		(OR)	
5.		Write a program for input restricted double ended queue using doubly link list.	12

UNIT-III

6.	a	Explain about the Selection Sort with an example.	6
	b	Write an algorithm for Binary search with suitable example	6
		(OR)	

7. Write a program to sort the following numbers using selection sort. 12
34,56,78,90,12,6,89,23,11
Show the steps of each iteration as how the numbers are sorted.

UNIT-IV

8. a What is a Binary search tree? Discuss. 6
   b Write an algorithm for insert an element into a binary search tree. 6

(OR)

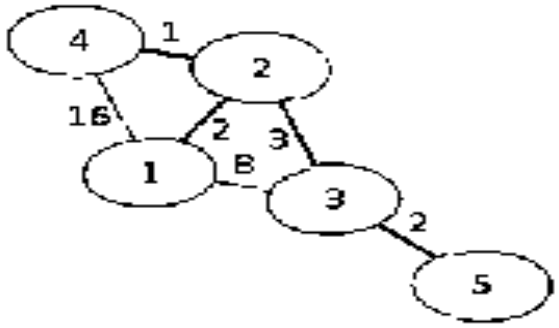
9. a How trees are using for expression evaluation? Explain with example. 6
   b Give the difference between binary trees,BST and balanced binary trees with example 6

UNIT-V

10. a What is a Graph? How graphs can be represented? Discuss. 6
    b Write an algorithm for BFS with example 6

(OR)

11. Write and explain Kruskal and Prim algorithm for Minimum Spanning Tree. 12
Run the algorithms for following graph.



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