AR18

CODE: 18EET101   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020

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 Decimal   6M
       i. $(4234)_{16}$
       ii. $(10111111)_2$
   b) Represent the following binary numbers in 2's complement   6M
   i) 11010   ii) 10000   iii) 11010   iv) 1101

(OR)

2. a) i. Represent the two decimal numbers 123 and 658 in Excess-3 code.   6M
   ii. Find the 9's complement of 6027 and express it in 2421 code.
   b) i. Convert gray code 101011 into its binary equivalent.   6M
   ii. Convert binary number 1011100010 to its gray code.

UNIT-II

3. a) Implement Boolean expression for Ex-OR gate and Ex-NOR using basic gates   6M
   b) Convert the following expressions in standard POS form   6M
       i.   f (A, B, C) = (A+B)(B+C)(A+C)
       ii.   f (A, B, C) = A . (A+B+C)

(OR)

4. a) Simplify the following three variable expressions using Boolean algebra.   6M

   $$i. \ Y = \sum m(1,3,5,7)$$

   $$ii. Y = \prod M(3,5,7)$$

   b) Simplify the following using K-Map

   $$f(A,B,C,D) = \sum m(0,3,5,6,9,10,12,15)$$

UNIT-III

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

(OR)

6. a) Draw the logic diagram of a 4-bit binary adder and briefly describe its functional operation   6M
   b) Briefly describe the concept of look- ahead carry generation with respect to its use in adder circuits.   6M

UNIT-IV

7.	a)	What is an encoder? Design octal to binary encoder.	6M
	b)	Design 8-to-1 multiplexer using basic gates	6M

(OR)

8.	a)	Design 1x8 de-multiplexer using basic gates.	6M
	b)	Design and implement a two bit comparator using logic gates.	6M

UNIT-V

9.	a)	Draw the logic diagram of an SR Flipflop using NAND gates and explain the operation with its truth table.	6M
	b)	Design mod-10 Ripple counter using JK flipflop.	6M

(OR)

10.	a)	Draw and explain the operation of parallel in parallel out shift register.	6M
	b)	Draw truth tables of D and T flip-flops.	6M

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AR18

CODE: 18EST104   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020
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)	Explain the following basic work shop processors i) Carpentry ii) Fitting	6M
	b)	Write some safety precautions in Forging and Sheet metal work.	6M

(OR)

2.	a)	Explain the following manufacturing processors i) Casting ii) Metal joining processors.	6M
	b)	What are the classification of materials used in the manufacturing process?	6M

UNIT-II

3.	a)	How do you classify chisels used in wood work?	4M
	b)	Explain any two work holding devices used in carpentry with a neat sketch.	8M

(OR)

4.	a)	How are the wood working tools classified according to their use?	6M
	b)	Draw the iron jack plane diagram and explain its parts	6M

UNIT-III

5.		Explain any six fitting operations with neat sketches.	12M

(OR)

6.	a)	Name and explain various types of files with diagrams.	8M
	b)	Why are flutes provided in a twist drill?	4M

UNIT-IV

7.	a)	Sketch different types of stakes used in sheet metal work, stating their applications.	8M
	b)	Why edge forming is necessary in sheet metal work	4M

(OR)

8.	a)	What is the difference between Piercing and Blanking?	4M
	b)	Give a detailed list of hand tools used in sheet metal work	8M

UNIT-V

9.	a)	What are the advantages of forging of metals?	4M
	b)	Write short notes on i) Fullers ii) Flatters iii) Swages iv) Sledge hammer	8M

(OR)

10.	a)	Why are forgings sometimes heat treated	4M
	b)	With neat diagrams explain various types of tongs used in forging	8M

1 of 1

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AR18

CODE: 18ECT101   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020
ELECTRONIC DEVICES
(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) Show that in an intrinsic semiconductor, the Fermi level is located at the middle of the unallowable energy gap. — 8M

    b) Find the concentration of holes and electrons in a p-type silicon at 300^0 K assuming resistivity as 0.02 Ω-cm. Assume μ_p=475 m^2/V-sec, n_i=1.45*10^{10} per cm^3. — 4M

(OR)

2. a) State and explain Mass-action law. — 6M

    b) Explain about extrinsic semi conductors in detail. — 6M

UNIT-II

3. a) Indicate the difference between the characteristics of silicon and germanium diodes and state approximately their cut-in voltages. — 6M

    b) A diode operating at 300^0K at a forward voltage of 0.4V carries current of 10mA when voltage is changed to 0.42V the current becomes thrice. Calculate the value of reverse leakage current and η for the diode (Assume V_T=26mV). — 6M

(OR)

4. a) Explain the term Diffusion capacitance of forward biased diode and derive the expression for it. — 8M

    b) Compare avalanche breakdown and zener breakdown. — 4M

UNIT-III

5. a) Explain how transistor will act as an amplifier. — 4M

    b) Explain the input and output characteristics of the transistor in CE configuration with diagrams. — 8M

(OR)

6. a) Derive the relation between base current and collector current. — 6M

    b) What is early effect? How does it modify the V-I characteristics of a BJT? — 6M

UNIT-IV

7. a) Why we call FET as a voltage controlled device? Explain? — 6M

    b) Compare enhancement and depletion mode MOSFETs. — 6M

(OR)

8. a) With neat sketch explain the drain and transfer characteristics of Enhancement MOSFET. — 7M

    b) Draw the Structure of an n-channel JFET and explain its principle of operation. — 5M

UNIT-V

9. a) What is a tunnel diode? Draw the V-I characteristics of tunnel diode and explain the occurrence of the negative differential resistance. — 6M

    b) Draw the equivalent circuit of UJT and explain its operation with the help of emitter characteristics. — 6M

(OR)

10. a) Explain the principle and working of Photo diode with neat diagrams. — 8M

    b) What are the advantages and applications of LED. — 4M

AR18

CODE: 18EST102   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020

PROGRAMMING FOR PROBLEM SOLVING
(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)	Explain the steps involved in C program development process.	6M
	b)	Give the block diagram of a computer. Explain functionality of each component.	6M
		(OR)	
2.	a)	Explain in detail about the various data types in C language.	6M
	b)	What do you mean by Formatted Input and Output? Explain in detail the prototype of *'scanf()'* and *'printf()'* in C.	6M

UNIT-II

3.	a)	What is the need of do-while and while loops? Discuss about their usage. Distinguish between them.	6M
	b)	Write a C program which reads 3 integers and prints the largest among them using nested if-else statement	6M
		(OR)	
4.	a)	Differentiate the conditional operator with if else statement. Explain with the help of an example.	6M
	b)	Write a C program to implement a simple calculator (Arithmetic Operatios) using switch statement.	6M

UNIT-III

5.	a)	What is meant by recursion? What are its uses? How it is implemented? Write a program to find the factorial of a number with recursion.	6M
	b)	Write a C program to perform the operation of addition of two matrices.	6M
		(OR)	
6.	a)	Discuss about call by reference and call by value with an example.	6M
	b)	Write about passing One-Dimensional array to functions with suitable example	6M

UNIT-IV

7.	a)	How to initialize and access pointer variable? Explain pointer to a function with example.	6M
	b)	Explain about Dynamic Memory Allocation with an example program?	6M
		(OR)	
8.	a)	What is a pointer? Explain pointer arithmetic with example.	6M
	b)	Explain the relationship between pointer and arrays with an example.	6M

UNIT-V

9.	a)	How to pass structure variable to functions? Explain with example.	6M
	b)	Create two text files and write a program to add the contents of one file at the end of another.	6M
		(OR)	
10.	a)	Write down the properties of a structure? Define a structure by capturing the properties of a student. Write a sample program to demonstrate the structure student	6M
	b)	Explain different random file access functions with example.	6M

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AR16

CODE: 16EE1001   SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020
BASIC ELECTRIC CIRCUIT ANALYSIS
(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) What are the applications and advantages of parallel circuits?   4
    b) Find the power absorbed by each element in the circuit shown in figure 1(b).
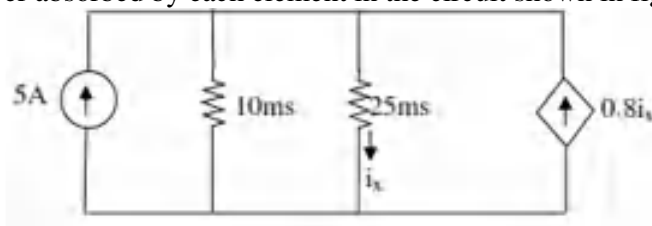
Fig. 1 (b)

(OR)

2. a) What are dependent Sources and write their symbols.   4
    b) Calculate the effective resistance between the points A and B in the circuit shown in below figure 2 (b)
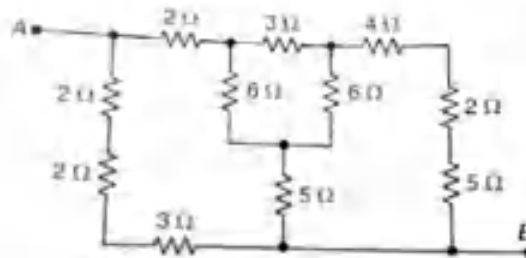
Fig. 2(b)

UNIT-II

3. a) For the voltage waveform shown in Fig. 3(a), calculate the current through an inductor if $L = 1/2$ henry and $i_L(0) = -2$ amperes.
    $V_L(t)$ volts
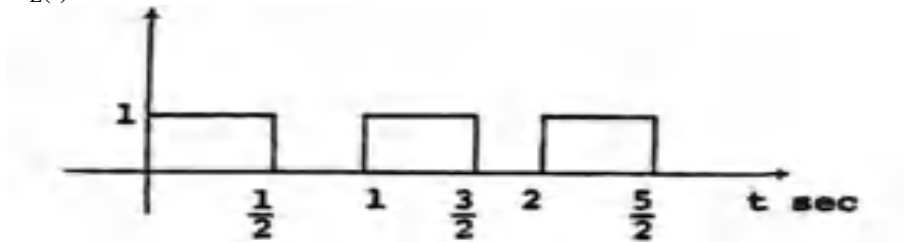
Fig. 3(a)

    b) (i) Explain the importance of dot convention in coupled circuits.
        (ii) State and explain Faraday's laws of electromagnetic induction.

4.   Find the current i_x in Fig. 4 by:

(i) changing the two practical voltage sources to practical current sources and then using nodal analysis;

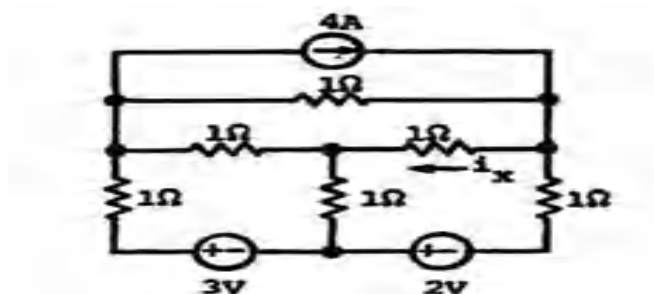(ii) changing the practical current source to a practical voltage source and again using nodal analysis.
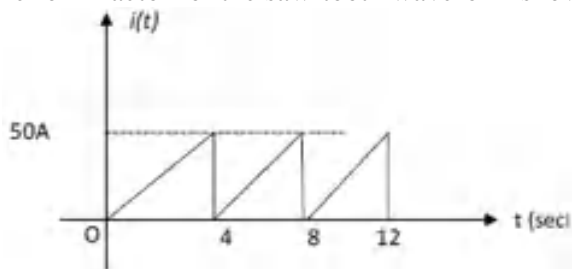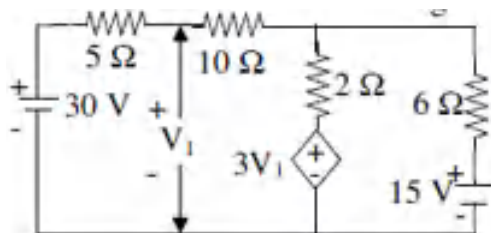

Fig. 4

UNIT-III

5. a)   Calculate the form factor for the saw-tooth waveform shown in figure   7M

b)   Find the current through each branch of the circuit shown in Figure, using mesh   7M
analysis.

(OR)

6. a)   A Choke coil connected across a 250V, 50Hz supply takes a current of 10A at 0.8   7M
power factor lagging. What will be the power taken by the choke when connected
across 220V, 25Hz supply?

b)   Find V_x for the given circuit?   7M
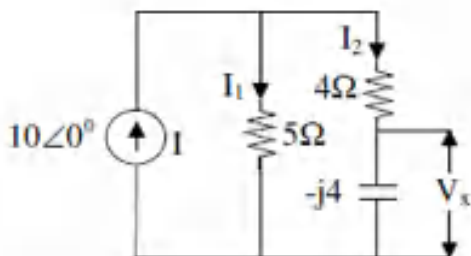
UNIT-IV

7. a) An inductive coil of resistance 10 Ω and inductance 0.1 H is connected in parallel **8M** with a 150 μF capacitor to a variable frequency, 200 V supply. Find the resonant frequency at which the total current taken from the supply is in phase with the supply voltage. Also find the value of this current.

   b) At resonance, the current is maximum in a series circuit and minimum in a parallel **6M** circuit. Why?

(OR)

8. a) For a given series RLC circuit with R=120Ω, L=0.6H and C=70μF, Calculate the **7M** resonance, lower and upper half power frequencies.

   b) An RLC Series circuit consists of R=1kΩ, L=100mH, C=10μF. If a voltage of **7M** 100V is applied across the combination, determine resonant frequency, quality factor and bandwidth.

UNIT-V

9. a) For the three-phase circuit shown below, find the average power absorbed by the **7M** delta-connected load with $Z_\Delta = (21 + j\, 24\,)$ohms
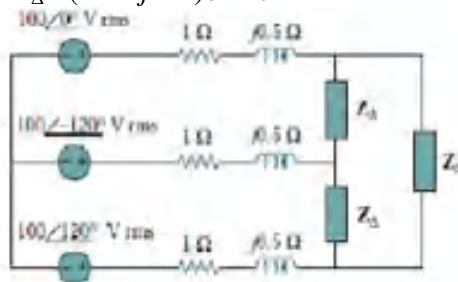
   b) The following impedances are connected in the form of a star connected **7M** unbalanced system and it is connected to a 400 V, 3- phase supply: $Z_R = 8 \angle 30^o$ Ω, $Z_y = 10 \angle 20^o$Ω ,$Z_B = 20 \angle 0^o$ Ω. Calculate line currents by using (i) loop method (ii) Star-delta transformation technique.

(OR)

10. a) A 400 V, 3-phase balanced supply is connected to an unbalanced delta load **7M** having three impedances 10-J 90Ω , 6+5J Ω and 50 Ω. Calculate line currents and power consumed if (i) the phase sequence is ABC (ii) the phase sequence ACB

    b) Two wattmeter's connected to a 3-phase motor indicate the total power input to **7M** be 12kW. The power factor is 0.6. Determine the readings of each wattmeter?

AR16

CODE: 16EE1002   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020
NETWORK ANALYSIS
(Electronics & Communication Engineering)

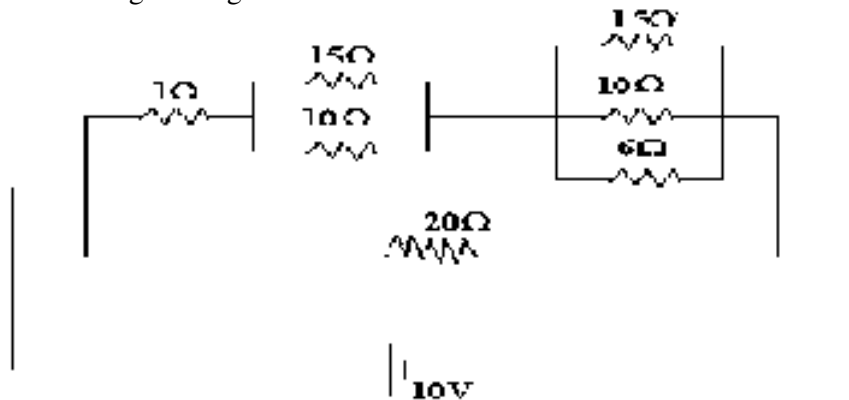**Time: 3 Hours**   **Max Marks: 70**

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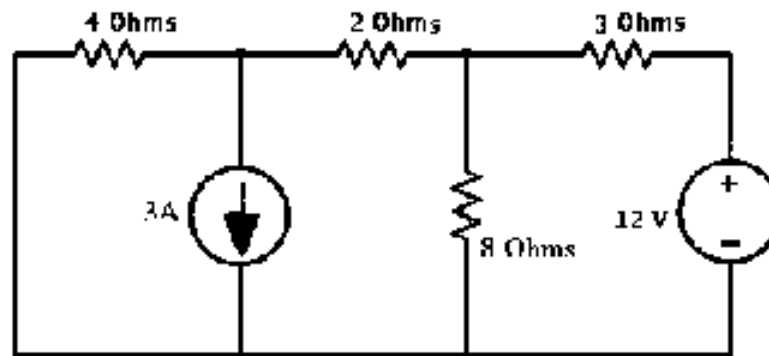All parts of the Question must be answered at one place

UNIT-I

1. a) Clearly explain the difference between ideal and practical voltage and current sources.   7M
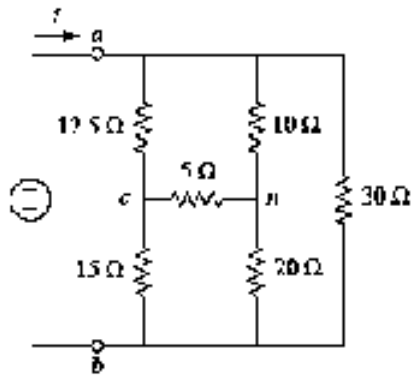   b) Find current through voltage source in the circuit shown below   7M

(OR)

2. a) Use source transformation to simplify the network to a single voltage source and single resistance.   8M
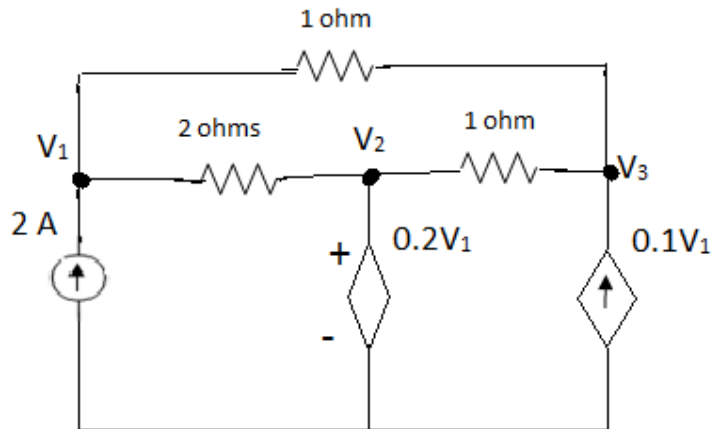

   b) Derive expressions for energy stored in capacitor.   6M

UNIT-II

3. a) Obtain the equivalent resistance across a and b terminals for the circuit shown below, by using star-delta transformation technique and find the current i for the input voltage of 140 V.　　　7M
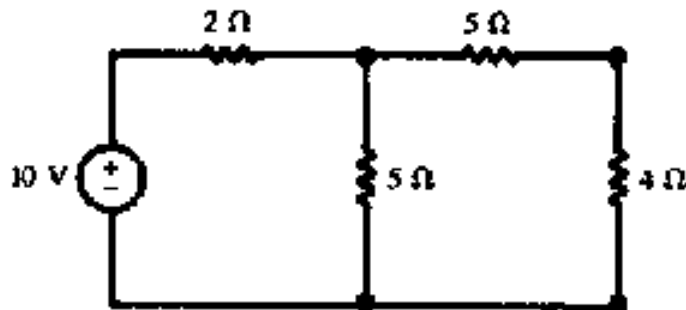

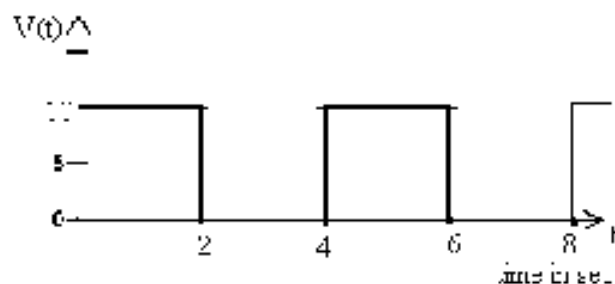b) Obtain the node voltages for the circuit shown below.　　　7M

(OR)

4. a) Using mesh analysis find current through 4Ω resistor.　　　8M
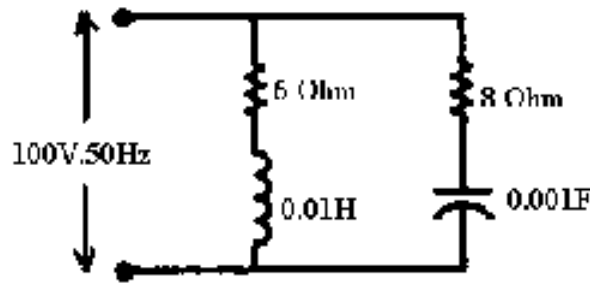

b) Find the average value of the following wave form shown below.　　　6M

UNIT-III

5. a) Find total impedance of following circuit.   7M

   b) A series circuit of R=10Ω and C=40μF has an applied voltage v=500cos(2500t —   7M
       20^0) find resulting current i.

                                    (OR)

6. a) Derive expression for bandwidth of series resonance circuit.   8M

   b) Calculate the value of R_C in the circuit of shown below to yield resonance. 6M
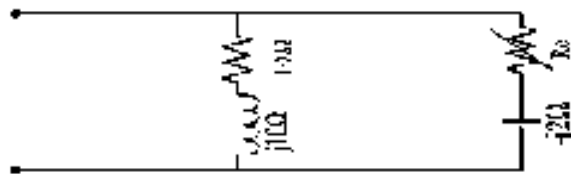
UNIT-IV

7. a) State and prove Maximum power transfer theorem.   6M
   b) Find the current through 'b-e' using Norton's theorem in the circuit shown below. 8M
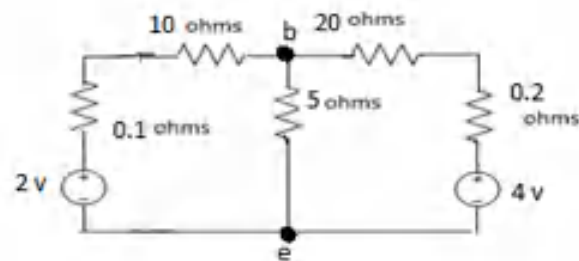
                                    (OR)

8. a) State and explain Thevenin's theorem.   8M
   b) Find the voltage across the 2Ω resistor in the following circuit by using the   6M
       superposition theorem.
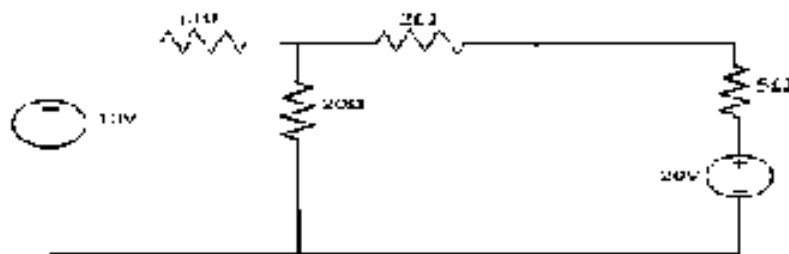
9. a) Determine Z parameters. 6M
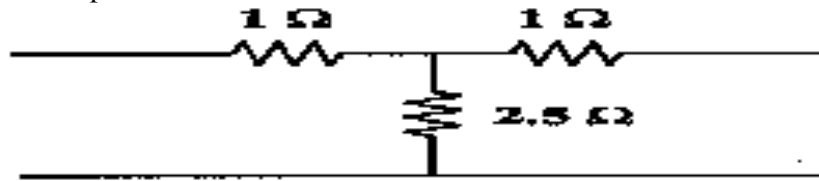
   b) Derive the relation between Z and Y parameters. 8M

(OR)

10. a) Determine h parameters. 7M
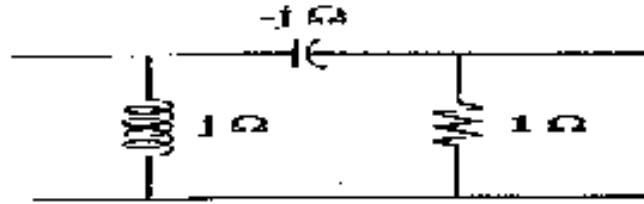
   b) A dc voltage of 100V is applied in the circuit shown below and the switch is kept open. The switch K is closed at t = 0. Find the complete expression for the current in the circuit. 7M

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AR16

CODE: 16CS1001   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020

COMPUTER PROGRAMMING
(Common to CE, ME, 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

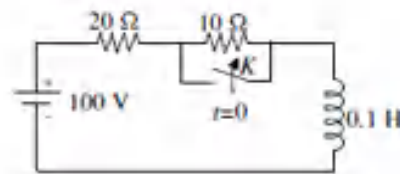|			
1.	a)	What is a computer language and describe the different types of computer languages?	7M
	b)	Describe the ternary conditional operator with suitable code example.	7M

(OR)

2.	a)	What is operator precedence? Describe through a table the operator precedence rules in C for different arithmetic, relational, logical, bit-wise operators & assignment operators?	7M
	b)	Write a program to find the roots of a quadratic equation if roots are real.	7M

UNIT-II

3.	a)	Explain the 'do while' iterative statement with a suitable code example.	7M
	b)	Write a program to find out whether a given number 'n' is a prime number or not.	7M

(OR)

4.	a)	Differentiate between if-else-if ladder and switch statement?	7M
	b)	Explain the construct 'continue' in C programming language with suitable code example.	7M

UNIT-III

5.	a)	Explain about the two different parameter passing mechanisms supported in C with suitable examples.	7M
	b)	Define recursion and explain with suitable example program.	7M

(OR)

6.	a)	Explain about the four different storage classes supported in C with suitable examples.	7M
	b)	Write a program to search an element in an array using function.	7M

UNIT-IV

7.	a)	Describe in detail declaration, definition, initialization, and access of structures with suitable code examples.	7M
	b)	Explain the different dynamic memory allocation/de-allocation functions available in C with suitable examples	7M

(OR)

8.	a)	What is a pointer and what are the advantages of using Pointers?	7M
	b)	Write a program to print the details of employees of an organization like (Name, Date Of Join, Salary) using nested structures.	7M

UNIT-V

9.	a)	Describe with examples the formatting strings for different built in data types in scanf and printf functions.	7M
	b)	Write a program that opens a file in read mode and counts the number of characters in the file.	7M

(OR)

10.	a)	Describe the following file handling functions in C. i. fclose ii. fgetc iii. ftell iv. fseek	7M
	b)	Write a program that opens a file in write mode & writes "Hello World!" into it.	7M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech I Semester Supplementary Examinations, February-2020
FUNDAMENTALS OF ELECTRICAL ENGINEERING
(Electrical & Electronics Engineering)

Time: 3 hours   Max Marks: 70

PART- A
Answer all questions   [10 x 1=10M]

1. a) Give examples of passive bilateral elements
   b) Define ohm's law
   c) Define form factor
   d) What is the r.m.s value of a.c. current given by i = 14.14 sin (ωt +π/6)
   e) Define Reluctance
   f) Define the Mutual inductance
   g) ---------- instruments can be used for measuring direct currents and voltages and alternating current and voltages.
   h) The ------------force acts on the moving system of an indicating instrument only when it is moving
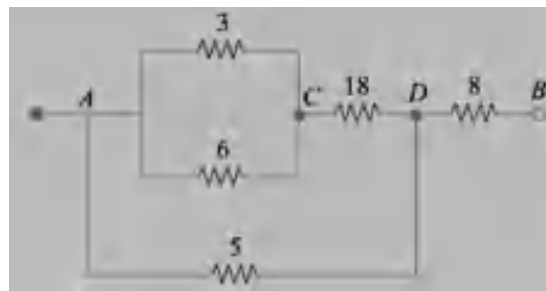   i) What is the advantage of fuse
   j) Define Adopter

PART-B
Answer one question from each unit   [5x12=60M]
UNIT-I

2. a) Define Kirchhoff's laws and Explain with an example   **(6M)**
   b) Find the effective resistance between A and B of the following combination of resistances   **(6M)**

(OR)
3. a) Explain and classify Dependent sources   **(6M)**
   b) Derive the expression for the effective resistance of 'n' resistors connected in parallel.   **(6M)**

UNIT-II

4. a) Define power factor and derive its expression   **(6M)**
   b) A voltage $v(t) = 200\sin 100\pi t$ is applied to a load having R=200 Ω in series with L=638 mH. Find
   i) Expression for current in sinusoidal form
                ii) Power consumed by the load
                iii) Voltage across R and L   **(6M)**

(OR)
5. a) Define Real Power , Reactive and complex power.   **(6M)**
   b) Two impedances $Z_1 = (5 - j13.1)$ Ω and $Z_2 = (8.57 + j6.42)$ Ω are connected in parallel across a voltage of $(100 + j200)$ volts
   Find i) Branch currents in complex form ii) Total Power Consumed   **(6M)**

UNIT-III

6. a) Compare Between Magnetic and Electric Circuits.   **(6M)**
    b) Derive the expression for equivalent inductance of two inductively coupled
    coils when they are connected in series aiding way.   **(6M)**

(OR)

7. a) What is co-efficient of coupling? Derive its expression.   **(8M)**
    b) Two inductively coupled coils have self inductances L_1 = 50 mH and L_2 = 200 mH.
       If the co-efficient of coupling is 0.5, find the value of the mutual inductance   **(4M)**

UNIT-IV

8.   Explain the construction and working of a PMMC instrument   **(12M)**

(OR)

9. a) Explain the construction and working of MI instrument.   **(6M)**
    b) Derive the equation for Deflection Torque   **(6M)**

UNIT-V

10. Explain the following electrical wiring accessories   **(12M)**
    i) Switches   ii)Ceiling Roses   iii) Lamp Holders and adopters
    iv)Sockets   v)Plug   vi)Fuses

(OR)

11. a) Explain different types of main switches   **(6M)**
    b)What is MCB and explain its uses   **(6M)**

AR13

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

PART-A

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

1. a) Write declaration of a pointer?
    b) Define variable with example
    c) List 3 keywords in C?
    d) What is FLOW CHART?
    e) Please Justify why C is a structured language?
    f) Quote the declaration of FOR loop?
    g) Explain EXTERN storage class?
    h) Write syntax of Do-While Loop?
    i) Define structure and union.
    j) Define array with syntax.

PART-B

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

UNIT-I

2. a) Discuss about conditional Operators in C?   6M
    b) Write about variable declaration in C? What happens if the variable is not   6M
        declared? Justify with an example?
                              (OR)
3. a) Draw a flow chart for factorial of a number?   6M
    b) What is the difference between the post increment and pre increment operators? 6M
        What is the output of the following if j=10, What are the values of j--;j++,++j,--j?

UNIT-II

4. a) Write about Continue and GoTO statements?   6M
    b) What is an array? How array is declared and how elements are stored in an array? 6M
                              (OR)
5. a) Illustrate Switch statement with an example?   6M
    b) Discuss about nested IF-ELSE statement?   6M

UNIT-III

6. a) Elaborate String handling Functions in C?   6M
    b) Define recursion and explain with a suitable example program.   6M
                              (OR)
7. a) Write about Call by Value and Call by Reference with appropriate examples? 6M
    b) Mention any 5 standard library functions in C? What is the use of library 6M
        functions?

UNIT-IV

8.	a)	Write a program to swap two numbers using Pointers?	6M
	b)	Explain Dangling Pointer?	6M

(OR)

9.	a)	Discuss about dynamic memory management functions?	6M
	b)	Distinguish Structure and Union and elaborate with an example?	6M

UNIT-V

10.	a)	What are various functions in character IO?	6M
	b)	Write an algorithm to copy contents of one file to other file?	6M

(OR)

11.	a)	What are various operations on file?	6M
	b)	Write about puts and fputs in C?	6M