

**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) What is an operator? List out various operators. Explain Logical and bitwise operators with examples. 6M
 - b) Define an algorithm. Write an algorithm to find the sum of even numbers up to N. 6M
- (OR)**

2. a) Explain about different C Tokens. 6M
- b) Explain the structure of the C program with simple example. 6M

UNIT-II

3. a) Write the general form of nested if and explain with example program. 6M
 - b) Write a C program to find largest number from given three numbers. 6M
- (OR)**

4. a) Write the general form of do...while loop. How do...while loop differs from while loop with example. 6M
- b) Write a C program to read an integer N and find the sum of integers upto N. 6M

UNIT-III

5. a) Define an array. How to initialize and access two dimensional arrays with examples. 6M
 - b) Define recursion. Write a C program to find factorial of a given number using recursion. 6M
- (OR)**

6. a) Explain various types of functions with examples. 6M
- b) Define string. List string handling functions with examples. 6M

UNIT-IV

7. a) Write a C program to read and display elements of two dimensional arrays using pointers. 6M
 - b) List dynamic memory allocation functions. Explain any of two with suitable example program. 6M
- (OR)**

8. a) Define pointer. Explain pointer arithmetic with suitable examples. 6M
- b) Explain in detail about call-by-value and call-by-reference with examples. 6M

UNIT-V

9. a) Define structure and write its general form. Explain about accessing structure elements with example. 6M
 - b) Write a C program to read and display an employee details (Employee name, id and salary) using structure. 6M
- (OR)**

10. a) Explain about file handling functions with general form and examples. 6M
- b) Explain about random access functions in files. 6M

**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) Using the polynomial method of number conversion , 6M
determine the equivalent binary number for each of the following:
a) $42_{(10)}$ b) $78.5_{(10)}$ c) $201_{(3)}$ d) $21.2_{(3)}$ e) $204_{(8)}$ f) $56.3_{(8)}$
- b) How do you convert an n-bit binary number in to gray code. 6M
(OR)
2. a) Represent the following binary numbers using 2's 6M
complement and 1's complement.
(a) 110101101 (c) 1001010011
(b) 1101010000 (d) 100110000
- b) Represent the decimal number 8620 (a) in BCD code (b) in 6M
excess-3 code, (c) in 2, 4, 2, 1 code, and (d) as a binary number.

UNIT-II

3. a) Reduce the following Boolean expressions to the required 6M
number of literals.
(a) $ABC + A'B'C + A'BC + ABC' + A'B'C'$ to five literals
(b) $Bc + ac' + ab + bcd$ to four literals
- b) Find the minimal SOP expression using k-map for the 6M
following expression.
 $F(w, x, y, z) = \sum(1, 5, 6, 12, 13, 14) + d(2, 4, 8)$
(OR)
4. a) Obtain the minimal SOP expression using K-map. Draw the 6M
circuit using gates.
 $F(a, b, c, d) = \prod(5, 8, 14) + d(7, 11, 12, 13, 15)$
- b) List the universal gates? Implement XOR & XNOR gates 6M
using basic gates?

UNIT-III

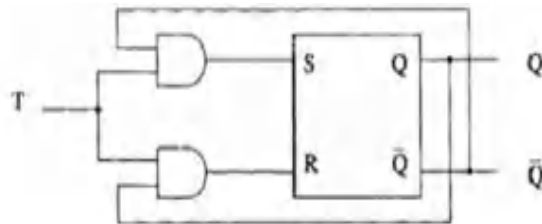
5. a) Design 4-bit binary adder. 8M
b) Design half subtractor. 4M
(OR)
6. a) Design full adder with two half adders, OR gate. 6M
b) Design half adder using only gates. 6M

UNIT-IV

7. a) Design BCD seven segment display decoder. 6M
b) Design 8x1 multiplexer using basic gates. 6M
(OR)
8. a) Construct a 5x32 decoder using basic gates. 6M
b) Design an octal to binary encoder. 6M

UNIT-V

9. a) Determine how the circuit shown in Fig. 1 functions as a T-type flip-flop. What problem would there be when $T=1$ and how could it be resolved. 6M



- b) Convert a SR flip-flop to D type flip flop? 6M
(OR)
10. a) Explain JK flip flop with truth table. 6M
b) Explain synchronous and ripple counters. Compare their merits and demerits. 6M

AR18

CODE: 18EST104

SET-2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I B.Tech I Semester Regular & Supplementary Examinations, December-2019

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) | What do you understand manufacturing processes | 4M |
| b) | Explain the basic workshop processes and their applications | 8M |
| (OR) | | |
| 2. | Classify the manufacturing process and explain any three manufacturing process | 12M |

UNIT-II

- | | | |
|-------------|--|----|
| 3. a) | Describe various cutting Tools in carpentry | 4M |
| b) | Distinguish between marking gauge and mortise gauge | 8M |
| (OR) | | |
| 4. a) | Explain the following tools used in carpentry (i) Boring Tools (ii) Striking tools | 6M |
| b) | Explain different types of joints used in carpentry | 6M |

UNIT-III

- | | | |
|-------------|---|----|
| 5. a) | Describe tools used for marking and measuring | 6M |
| b) | Explain different cutting tools used in fitting | 6M |
| (OR) | | |
| 6. a) | Explain (i) Dieing (ii) Reaming (iii) Tapping | 6M |
| b) | Explain (i) Chipping (ii) Scraping (iii) Grinding | 6M |

UNIT-IV

- | | | |
|-------------|--|----|
| 7. a) | List the common sheet metal working machines giving their uses | 6M |
| b) | Explain the function of (i) Snip (ii) Stake (iii) Hand hammer | 6M |
| (OR) | | |
| 8. a) | Describe sheet metal working operations (i) Shearing (ii) Bending | 6M |
| b) | Explain (i) Drawing (ii) Squeezing operations in sheet metal working | 6M |

UNIT-V

- | | | |
|-------------|--|----|
| 9. a) | Explain any four tools used in forging | 6M |
| b) | Write the advantages of forging | 6M |
| (OR) | | |
| 10. a) | Explain with neat sketches (i) Upsetting (ii) setting down | 6M |
| b) | Explain with neat sketches (i) Swagining (ii) Fullering | 6M |

**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) Explain about an intrinsic semiconductor? 6M
b) Classify materials based on the energy band diagram. 6M
- (OR)
2. a) What is Hall effect? Derive an expression for Hall coefficient? 6M
b) An n-type silicon bar 0.1cm long and $100\mu\text{m}^2$ in cross sectional area has a majority carrier concentration of $5 \times 10^{20} \text{ m}^{-3}$ and carrier mobility of $0.13 \text{ m}^2/\text{V-S}$ at 300K. If charge of electron is 1.6×10^{-19} coulomb, calculate the resistance of bar? 6M

UNIT-II

3. a) What is Zener diode? Draw and explain the equivalent circuit of an ideal Zener in breakdown region? 6M
b) At 300K for a diode current of 2mA, a certain Germanium diode requires a forward bias of 0.1435V, whereas Silicon diode requires a forward bias of 0.718V. Calculate the ratio of reverse saturation current in Germanium to Silicon diode? 6M
- (OR)
4. a) Explain the operation of PN junction diode under forward and reverse bias conditions? 6M
b) Discuss about various parameters involved in diode current equation? 6M

UNIT-III

5. a) Derive the relation among α , β , γ ? 6M
b) Compare CB, CC, and CE circuits? 6M
- (OR)
6. a) The value of $\alpha = 0.9$, find β . Suppose base current is $100\mu\text{A}$ and I_{co} is 0.5mA. Calculate collector and emitter currents for CE configuration? 6M
b) Draw circuit diagrams for transistor in CC configuration and explain its input and output characteristics? 6M

UNIT-IV

7. a) Explain working of an n-channel enhancement type MOSFET and draw its drain and transfer characteristics? 6M
b) A FET follows relation $I_D = I_{DSS} [1 - V_{GS}/V_p]^2$. What are the values of I_D and g_m for $V_{GS} = -1.5\text{V}$, if I_{DSS} and V_p are given as 8.4mA and -3V respectively? 6M
- (OR)
8. a) Compare JFET over BJT? 6M
b) Explain working of n-channel JFET with its drain and transfer characteristics? 6M

UNIT-V

9. a) Explain operation and V-I characteristics of tunnel diode? 6M
b) Draw constructional diagram of SCR and explain its working? 6M
- (OR)
10. a) Write short notes on Photo diode? 6M
b) Write short notes on Varactor diode? 6M

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) State Kirchhoff's laws. 4
- b) Use nodal analysis to determine V and power being supplied 10
by the dependent current source in the circuit shown in Figure
1(b). All the values of resistances in the circuit are in ohms.

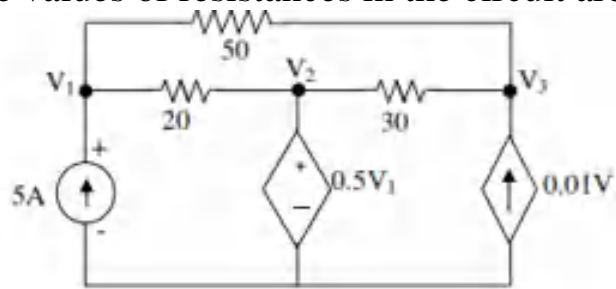


Fig. 1(b)

(OR)

2. Explain the star-delta transformation and delta-star 14
transformation and derive the expressions for equivalent
resistances.

UNIT-II

3. a) The current through a 10H inductor is observed to be the 12
function plotted in Fig 3 (a). Plot the function $V_L(t)$

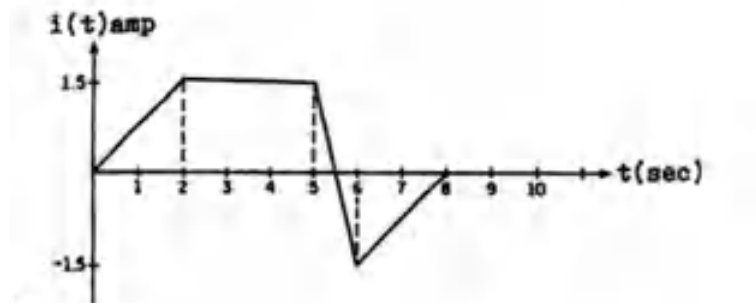
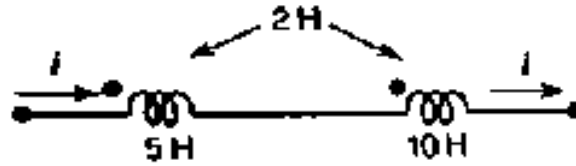


Fig. 3(a)

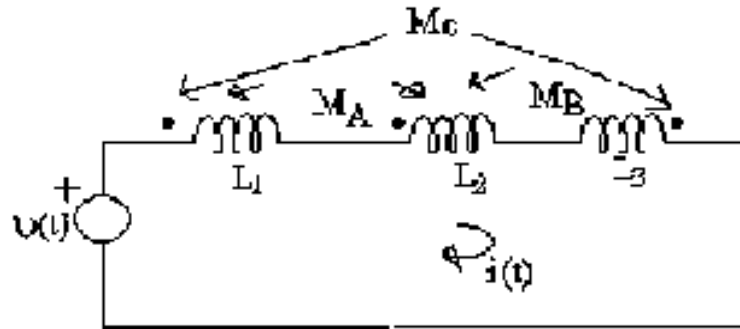
- b) Mention the difference between nodal analysis and mesh analysis. 2

(OR)

4. a) Explain the dot convention used in magnetically coupled circuits and Find the effective value of the inductance for the following connections as shown in figure 7

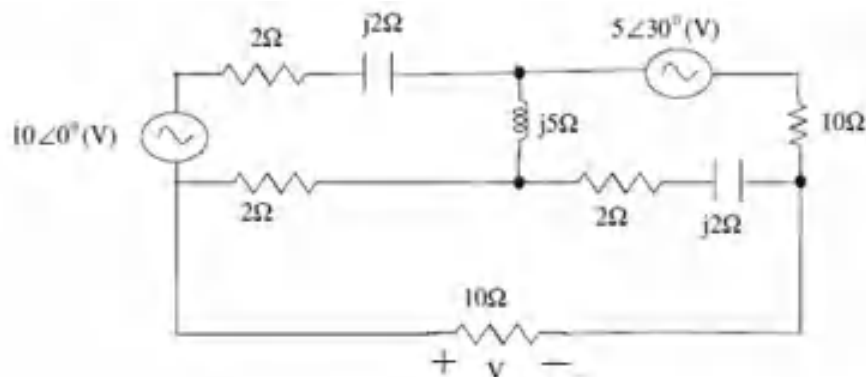


- b) Write down the voltage equation for the following figure and determine the effective inductance 7

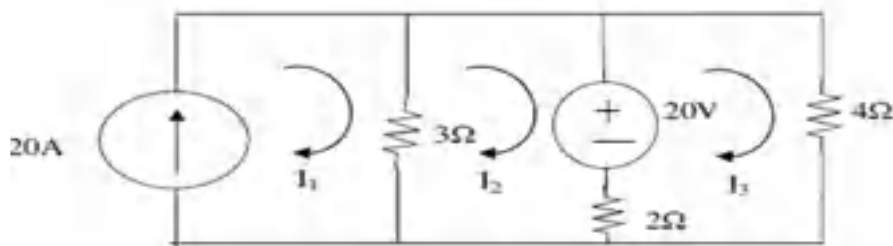


UNIT-III

5. a) Write the loop equations of the circuit as shown in figure and find the V 7

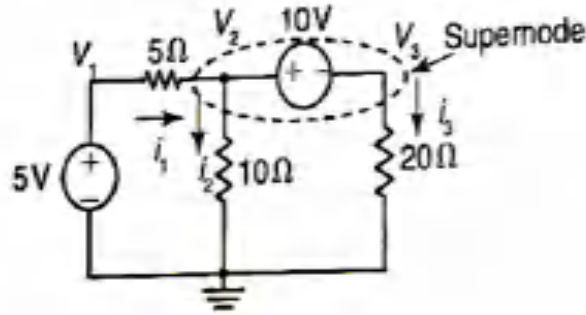


- b) Write the mesh equation for the circuit shown in figure and determine the currents I1, I2 and I3 7

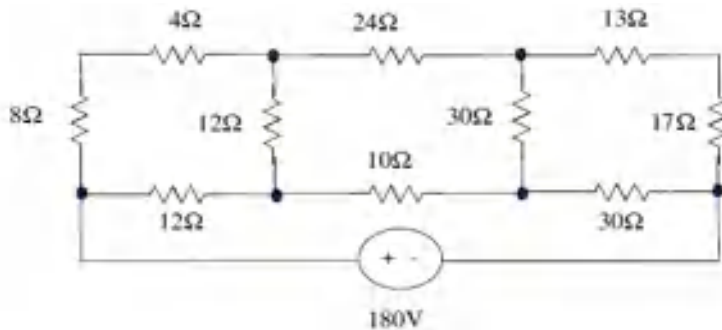


(OR)

6. a) Determine the node voltages V_1 , V_2 and V_3 for the circuit shown 7



- b) Determine the current through 10Ω resistance in the network shown 7



UNIT-IV

7. A series RLC circuit consists of resistance $R = 20\Omega$, 14 inductance, $L=0.01\text{H}$ and capacitance $C= 0.04\mu\text{F}$. Calculate the frequency at resonance. If a 10 Volts of frequency equal to the frequency of resonance is applied to this circuit, calculate the values of V_C and V_L across C and L respectively. Find the frequencies at which these voltages V_C and V_L are maximum?

(OR)

8. a) A series RLC circuit is connected to a constant voltage 10 variable frequency source of 200 V (rms). The values of R , L and C are 5Ω , 0.1 H and $100\mu\text{F}$. What would be the voltage across C at resonance? 10
- b) Bring out the differences between series and parallel resonance. 4

UNIT-V

9. Each phase of a balanced three phase delta connected load 14 has a 0.2 Henry inductor in series with a parallel combination of a 6 μF capacitor and 90 ohm resistance. If a 3- phase voltage of 400 V at a frequency of 50Hz is applied to this load, find i) phase current ii) line current and iii) total power absorbed by the load.

(OR)

10. Three inductive coils each of resistance 4 ohms and an 14 inductive reactance of 5 ohms are connected in star and supplied from three phase 400V 50 Hz supply. What are the line and phase currents and voltages? Also calculate the power input and power factor.

NETWORK ANALYSIS**(Electronics & Communication Engineering)****Time: 3 Hours****Max Marks: 70**

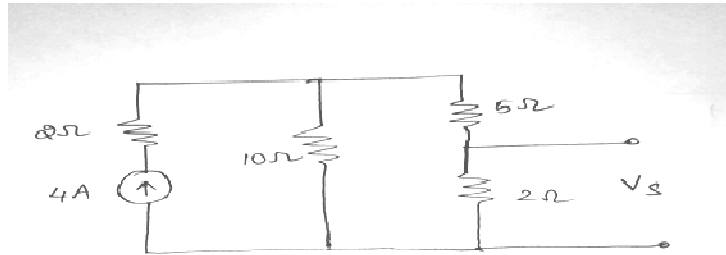
Answer ONE Question from each Unit

All Questions Carry Equal Marks

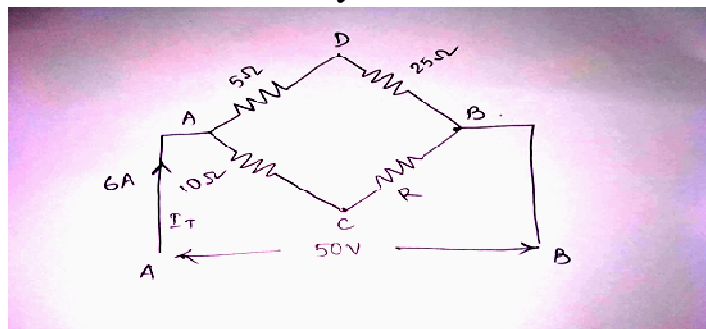
All parts of the Question must be answered at one place

UNIT-I

1. a) Explain Kirchhoff's laws? 7M
- b) Determine the current in the 10 ohms resistance and find V_s in the circuit shown below: 7M

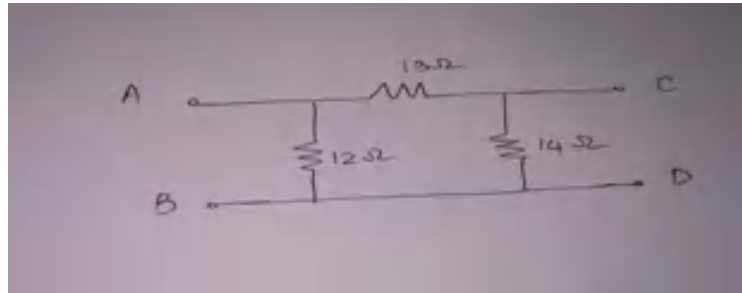
**(OR)**

2. a) Develop the expression for energy stored in a capacitor? 7M
- b) Determine the value of R and current in each branch when total current taken by the circuit is 6A. 7M



UNIT-II

3. a) Obtain the star connected equivalent for the delta connected circuit: 7M



- b) Explain in detail nodal analysis with a suitable example? 7M

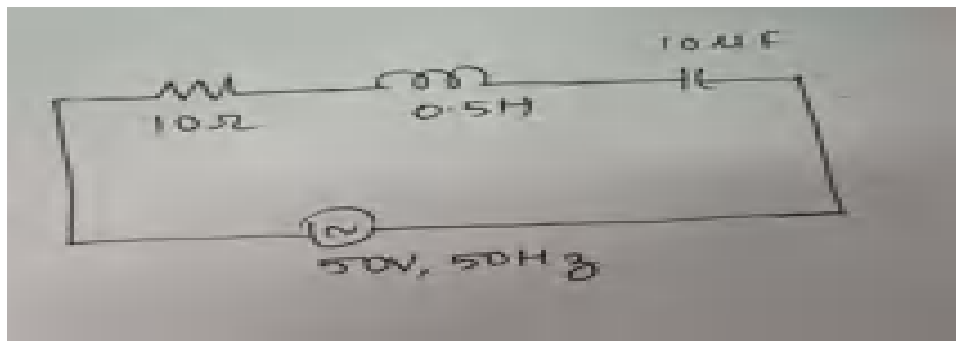
(OR)

4. a) Derive the Average value of sinusoidal waveform? 7M

- b) Explain in detail mesh analysis with a suitable example? 7M

UNIT-III

5. In the circuit shown below, determine the total impedance, current, phase-angle, voltage across each element. 14M

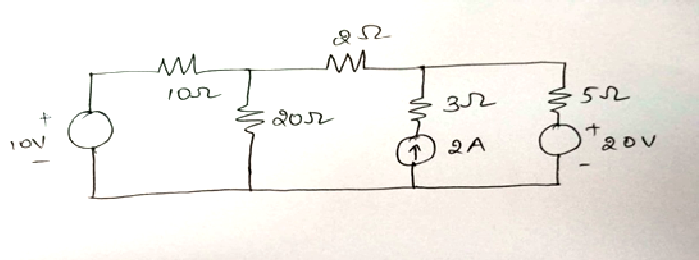


(OR)

6. Develop the expression for bandwidth of an RLC circuit? 14M

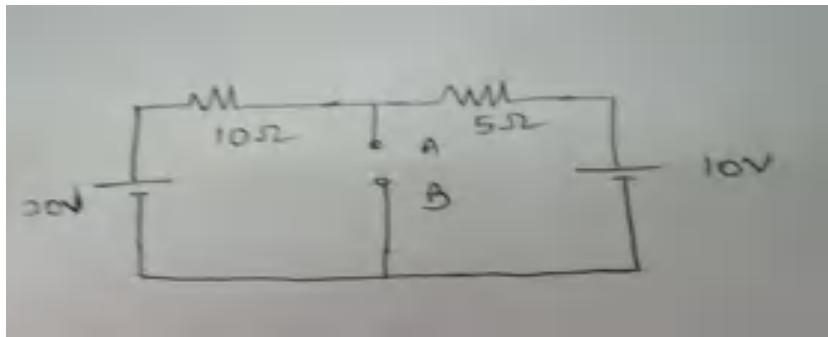
UNIT-IV

7. a) State and explain Thevenins theorem? 7M
 b) Find the voltage across 2 ohms resistor by using Super Position Theorem. 7M



(OR)

8. a) State and explain Nortons theorem? 7M
 b) Determine Nortons equivalent circuit at terminals AB for the below circuit: 7M

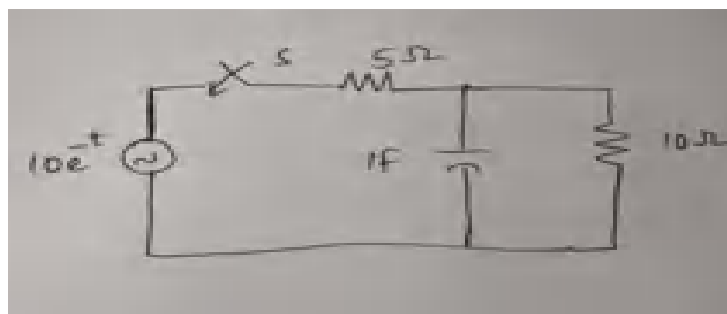


UNIT-V

9. Develop the relationship of Z-parameters in terms of Y-parameters. 14M

(OR)

10. For the below circuit, determine the total current delivered by the source when the switch is closed at $t=0$. Assume no initial charge on capacitor. 14M



**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.

UNIT-I

1. What is a flowchart? What are the symbols used in flowchart? Draw a flowchart to find maximum of three numbers 14M

(OR)

2. a) Explain the steps involved in C program development process 7M
b) What is meant by a variable in C programming? How a variable is initialized? 7M
Explain the rules for defining variable names.

UNIT-II

3. Explain different looping statements with syntax and examples. 14M

(OR)

4. Explain if-else statement and nested if-else statement with syntaxes and suitable examples. 14M

UNIT-III

5. a) What is a function? What are the uses of functions? 7M
b) Write a C program to add two 2-dimensional arrays. 7M

(OR)

6. a) Write a C program to find factorial of a given number using recursion. 7M
b) Explain how arrays are passed as function arguments. Write a C program to add two 2-dimensional arrays using the concept of arrays as function arguments. 7M

UNIT-IV

7. Explain about call by value and call by reference with reference to functions. Write a function to swap the values between the variables using call by value and call by reference. 14M

(OR)

8. Explain the following dynamic memory management functions with example: (i) malloc() (ii) calloc() (iii) realloc() (iv) free() 14M

UNIT-V

9. Explain the following with example: (i) fprintf() (ii) fscanf() (iii) fgets() (iv) feof() (v) rewind() (vi) fseek() (vii) ftell() 14M

(OR)

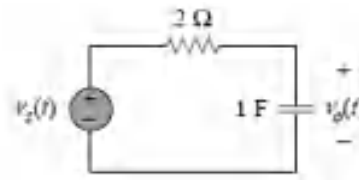
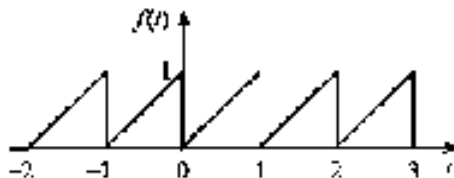
10. a) Write about defining, opening and closing a file 7M
b) Explain formatted I/O . 7M

**FUNDAMENTALS OF ELECTRICAL ENGINEERING
(Electrical and Electronics Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) What is bilateral element?
- b) Name few standard inputs?
- c) Define form factor?
- d) Define power factor?
- e) What is flux density?
- f) Explain dot convention?
- g) What is indicating instrument?
- h) How a PMMC instrument can be used as flux meter?
- i) What is the importance of MCB's?
- j) Explain plugs?

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

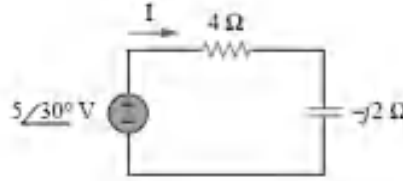
2. a) Derive the Voltage Current relationship in a Resistor, Inductor and Capacitor? 10M
 - b) Define the Electric current and Voltage? 2M
- (OR)**
3. a) If the saw tooth wave form in fig is the voltage source $V_s(t)$ in the circuit find the response $V_o(t)$ 6M



- b) State Kirchhoff's laws? 6M

UNIT-II

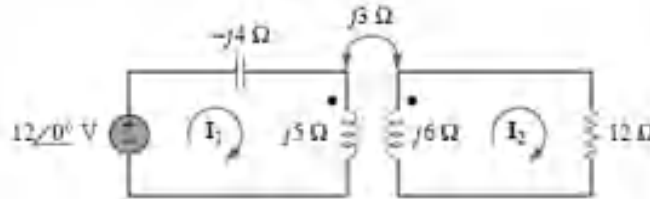
4. For the circuit shown find the average power supplied by the source and average power absorbed by the resistor and Voltage across each element. 12M

**(OR)**

5. Explain the sinusoidal response of series RL circuit and derive necessary expressions? 12M

UNIT-III

6. a Calculate the phasor currents I_1 and I_2 ? 6M



- b An iron ring of 10 cm diameter and 15 cm² cross section is wound with 250 turns of wire for a flux density of 1.5 web/m² and permeability 500. Find the exciting current, the inductance and stored energy? 6M

(OR)

7. a Define flux density, magneto motive force and reluctance? 6M
- b Two inductively coupled coils have self inductance $L_1 = 50\text{mH}$ and $L_2 = 200\text{mH}$. If the coefficient of coupling is 0.5 (a) find the value of mutual inductance between the coils and (b) what is the maximum possible mutual inductance? 6M

UNIT-IV

8. Draw the sketch and explain the principle of PMMC type instruments. 12M

(OR)

9. a Why is a controlling torque necessary in an analog indicating instrument? What would happen in the absence of a controlling torque? 6M
- b What is an instrument? Explain the classification of instruments? 6M

UNIT-V

10. Explain in details (i) accessories switches (ii) ceiling roses (iii) lamp holders (iv) Adopters (v) sockets (vi) fuses? 12M

(OR)

11. Explain in detail different types of main switches (DP mains, ICDP, ICTP)? 12M

3 of 3

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

I B. Tech I Semester Supplementary Examinations, December, 2019

ELECTRONIC DEVICES

(Electronics and Communication Engineering)

Time: 3 hours

Max Marks: 70

PART- A

Answer all questions

[10 x 1=10M]

1. a) What are the applications of SCR?
- b) Define hole and an electron.
- c) Define mass action law.
- d) Define peak inverse voltage of a diode.
- e) Define early effect?
- f) What are the advantages of FET?
- g) Define Dynamic Resistance of a diode.
- h) What is meant by depletion region?
- i) What is zener breakdown mechanism.
- j) What are the applications of Photo diode?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Explain in detail the block diagram of a CRO and give its applications.
- b) Explain about Cathode Ray Tube

[6M+6M]

(OR)

3. Discuss the motion of an electron in parallel and perpendicular electric field and magnetic fields in detail.
[12M]

UNIT-II

4. a) Classify the materials based on Energy band diagram.
- b) Explain about intrinsic and extrinsic semiconductors.

[6M+6M]

(OR)

5. a) Explain Continuity Equation in detail.
b) Find the concentration of holes and electrons in N-type silicon at 300^0K . If the conductivity is $0.1(\Omega\text{-cm})^{-1}$. Given that n_i at 300^0K for silicon is $1.5 \times 10^{10}/\text{cm}^3$, μ_e at 300^0K for silicon is $1,300\text{ cm}^2/\text{Vs}$. [6M+6M]

UNIT-III

6. a) Draw and explain working principle of LED and also its V-I characteristics.
b) Explain the operation of Half wave rectifier with circuit and waveforms. [6M+6M]

(OR)

7. a) Draw and explain P-N junction diode in forward and reverse bias conditions and also explain its V-I characteristics.
b) Write short notes on
(i) Varactor Diode
(ii) PIN Diode [6M+6M]

UNIT-IV

8. a) Draw and Explain the circuit diagram of Common Base transistor with the help of input and output characteristics
b) Compare CB, CE and CC configurations. [6M+6M]

(OR)

9. a) Explain the terminals of a transistor.
b) Derive relation between α and β of a transistor.
c) Explain the input and output characteristics of CE configuration [4M+4M+4M]

UNIT-V

10. a) Draw the structure of n-channel JFET and explain its drain and transfer characteristics.
b) Compare BJT and JFET.. [8M+4M]

(OR)

11. a) Define and explain the three parameters of JFET and give relations between them.
b) Explain in detail Dual Gate MOSFET. [6M+6M]

AR13

CODE: 13CS1001

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, DECEMBER, 2019

COMPUTER PROGRAMMING
(CIVIL,ME,CSE&IT)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Write the answer for this $(5 > 4) ? 3 : 6$
b) Write syntax for While statement?
c) What is token in C?
d) What if the value of $n++$, where $n=8$?
e) Is C a high level language? Why?
f) Write declaration of 2-D array?
g) List some uses of Constants in C?
h) Mention two uses of Pointers?
i) Write about Boolean AND operator in C?
j) Write two operations on files?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Discuss about various basic data types in C? 6M
b) Write a program to find average of 3 numbers? 6M
(OR)
3. a) Write and explain Keywords in C? 6M
b) Write various steps in the program development? 6M

UNIT-II

4. a) Discuss about various forms of IF statement? 6M
b) Illustrate Break and Continue statements in C? 6M
(OR)
5. a) Write about nested switch statement? 6M
b) What happens if Break is not given in the Switch statement? Elaborate with an example? 6M

UNIT-III

6. a) Explain parameter passing in C? 6M
b) Explain briefly about arrays? How to access and store elements in an array? 6M
(OR)
7. a) Discuss Storage Classes in C? 6M
b) What is recursion? Write a program for factorial using recursion? 6M

UNIT-IV

8. a) Write about declaration and initialization of Structures? 6M
b) Explain command line arguments in C? 6M
(OR)
9. a) Write about declaration and initialization of Unions? 6M
b) Write a sample program to pass command line arguments in C? 6M

UNIT-V

10. a) Explain formatted I/O. 6M
b) Write about gets and fgets in C? 6M
(OR)
11. a) Differentiate Binary and Text files? 6M
b) Write a program to find number of lines in a file? 6M