# AR20

**CODE: 20EST101** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

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

**BASIC ELECTRICAL ENGINEERING**

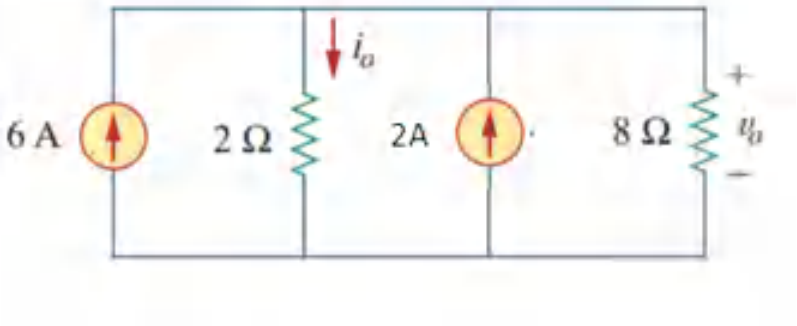
**(Common to CE, EEE, ECE)**

**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

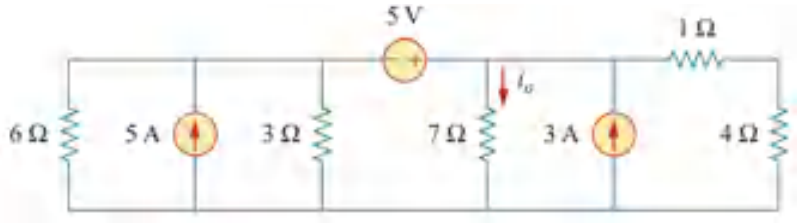
## UNIT-I

1. a) State and explain KVL and KCL 5M
   b) Find $i_0$ and $v_0$ in the circuit shown in figure. 5M

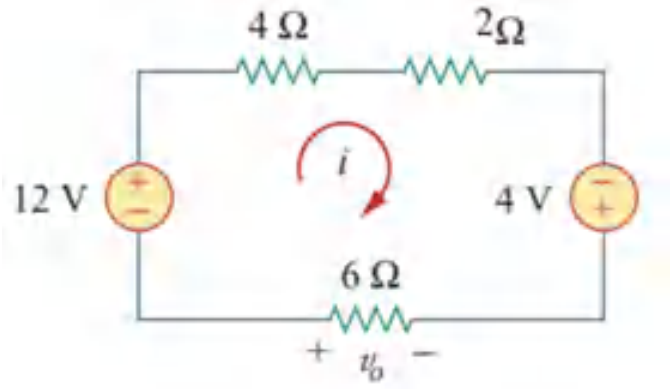



**(OR)**

2. a) For the following circuit find $i_0$ (use source transformation). 5M

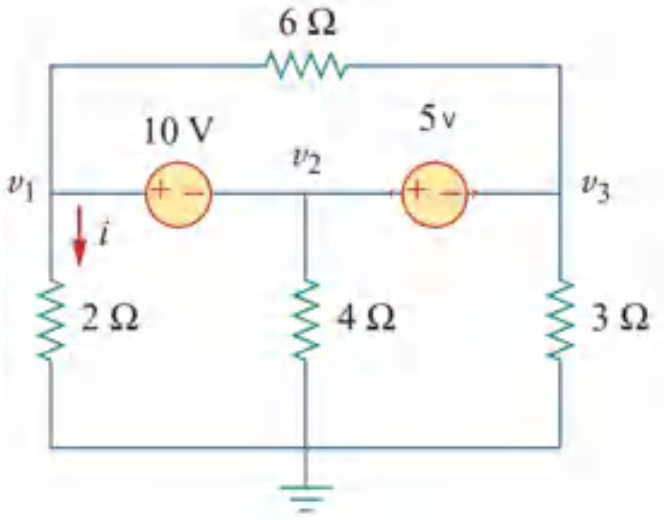



   b) Determine the i and $v_0$ in the circuit shown in figure. 5M

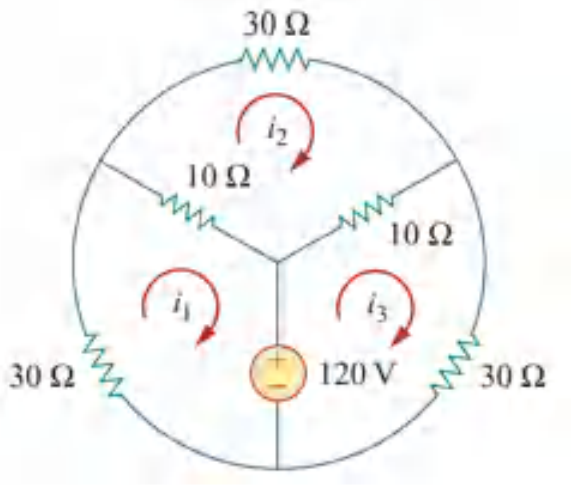


## UNIT-II

3. a) Determine the voltages ($V_1$ , $V_2$ and $V_3$) using nodal analysis. 5M

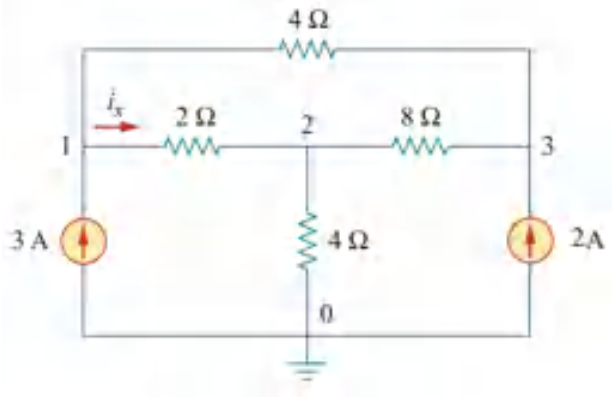



b) Use mesh analysis to find the currents $i_1$ , $i_2$ and $i_3$. 5M

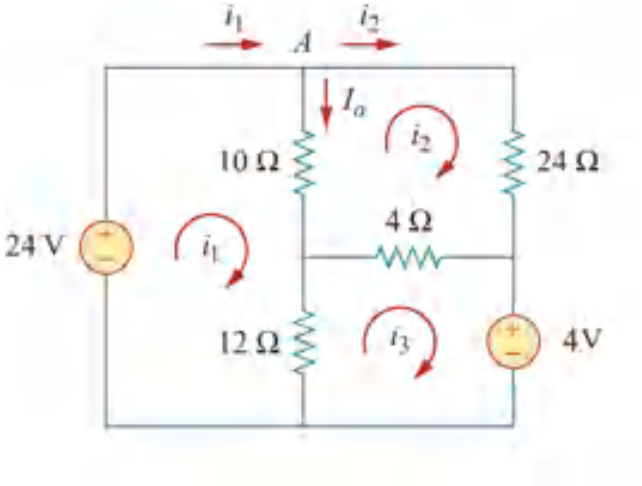



**(OR)**

4. a) For the following circuit, determine the voltages at the nodes 1, 2, and 3. 5M



b) For the following circuit, using mesh analysis find the currents $i_1$ , $i_2$ and $i_3$. 5M



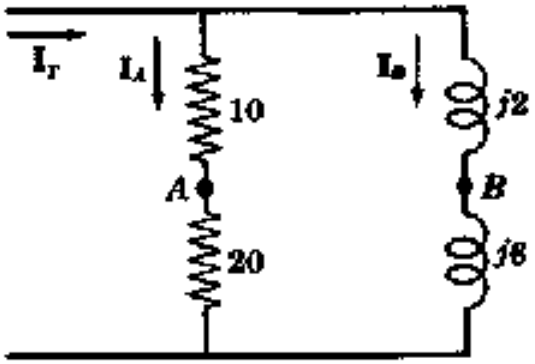

## UNIT-III

5. a) In the series circuit of R=10 ohms and C=40 μF has an applied voltage v(t)=500 cos (2500t-20°) volts. Find the current i. 5M

b) In a series circuit of R=ohms and L=0.03 H , the current lags the voltage by 80° . Determine the frequency of the source and the complex impedance Z of the circuit. 5M

**(OR)**

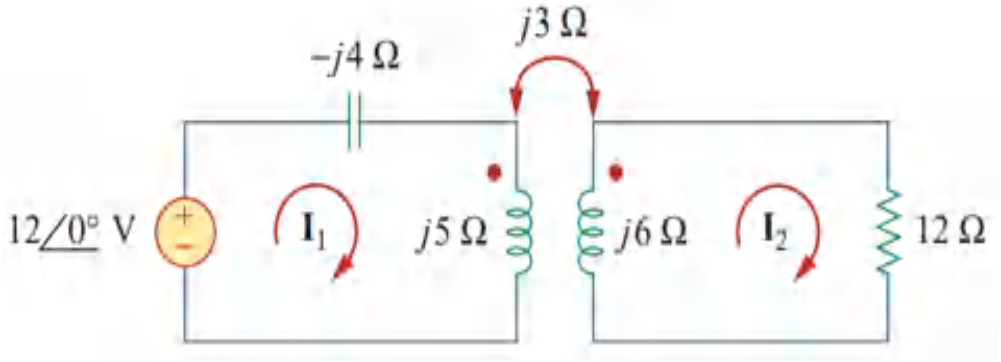
6. a) The total current entering the parallel circuit shown in figure is given by $I_T = 18\angle 45^\circ$. Determine the potential difference between points A and B. 5M




b) Given a circuit with an applied voltage v(t) = 150 sin(ωt+10°) volts and a resulting current i(t) = 5 sin(ωt-50°) amperes, determine the power triangle. 5M

## UNIT-IV

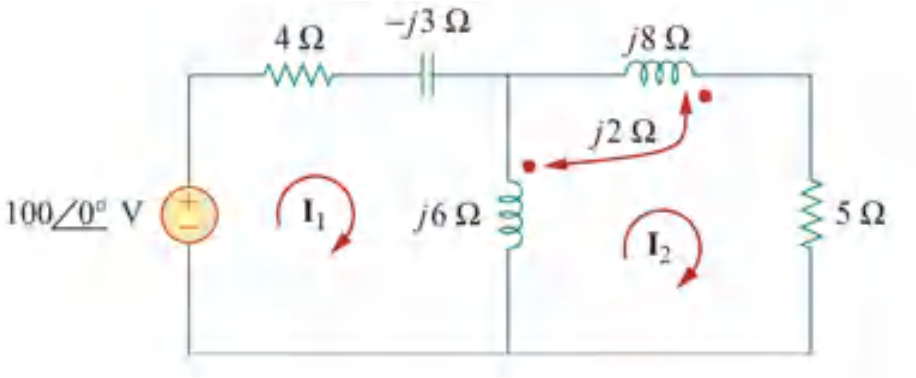
7. a) Determine the phasor currents $I_1$ and $I_2$ in the circuit shown in figure. 5M




b) Explain in detail about magnetically coupled circuits and dot notation. 5M

**(OR)**

8. a) Calculate the mesh currents in the circuit of the figure shown below. 5M




b) Explain the differences between magnetically coupled and conductively coupled circuits. 5M

## UNIT-V

9. a) Explain the construction of a DC machine with a neat sketch. 5M
   b) Explain in detail about open circuit characteristics of DC generator 5M

**(OR)**

10. a) Explain in detail about internal and external characteristics of a DC shunt generator 5M
    b) With neat sketches explain the working principle of the DC generator. 5M

## UNIT-VI

11. a) Explain the working principle of 3-point starter with a neat sketch. 5M
    b) Derive the expression for torque developed by DC Motor 5M

**(OR)**

12. a) Explain the various speed control methods of DC Motors. 5M
    b) Explain the principle operation of DC Motor? 5M

# AR20

**CODE: 20ESI102** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

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

**PROGRAMMING FOR PROBLEM SOLVING**

**(Common to ME, CSE & IT)**

**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 in detail, the sequence of steps to be followed in writing an algorithm for finding the sum of first 'N' natural numbers. Hint: Sum of First 'N' natural numbers = N(N+1) / 2 | 5M |
| | b) | List the basic data types, their sizes and range of values supported by 'C' language | 5M |
| | | **(OR)** | |
| 2. | a) | What are the steps involved in program development process? Explain | 5M |
| | b) | Explain about various logical operators available in C language with examples. | 5M |

## UNIT-II

| | | | |
|---|---|---|---|
| 3. | a) | Write a C program to generate and print the numbers between 100 and 200 which are divisible by 3 but not divisible by 4 | 5M |
| | b) | Explain if-else statement and nested if-else statement with syntaxes and suitable examples. | 5M |
| | | **(OR)** | |
| 4. | a) | Write a C program to illustrate switch and if-else statements. | 5M |
| | b) | Write a C program to perform arithmetical operations using switch case. | 5M |

## UNIT-III

| | | | |
|---|---|---|---|
| 5. | a) | What is Array? Discuss about the initialization and accessing of array elements in one dimensional and two dimensional arrays | 5M |
| | b) | Write a C program to find the length of a given string using strlen() | 5M |
| | | **(OR)** | |
| 6. | a) | What is an array? What are the disadvantages in implementing arrays in C language? Discuss problems for implementing of multi-dimensional arrays in C language. | 5M |
| | b) | Write a C program to check whether the given matrix is symmetric or not. | 5M |

## UNIT-IV

| | | | |
|---|---|---|---|
| 7. | a) | Write program for finding the GCD among two numbers using recursion | 5M |
| | b) | Explain various types of functions supported by C language? Give example for each of the C function. | 5M |
| | | **(OR)** | |
| 8. | a) | What is meant by recursion? What are its uses? How it is implemented? Explain with example. | 5M |
| | b) | Write a C program using the concept of functions to swap the values of variables without using third variable | 5M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | a) | Explain about structure and union with examples. | 5M |
| | b) | Explain about nested structures with an example program. | 5M |
| | | **(OR)** | |
| 10. | a) | Write a C program to store and print name, USN, subject and IA marks of students using structure | 5M |
| | b) | Explain with example how to create a structure using „typedef" | 5M |

## UNIT-VI

| | | | |
|---|---|---|---|
| 11. | a) | Explain the following functions in files: (i) fseek( ) (ii) ftell( ) (iii) rewind( ) (iv) fopen( ) (v) fclose( ) | 5M |
| | b) | Write a program in C to reverse the contents of a file using random access file mode | 5M |
| | | **(OR)** | |
| 12. | a) | Write a program that changes every lowercase character of data file into uppercase and vice versa | 5M |
| | b) | Explain the following with example: (i) fprintf( ) (ii) fscanf ( ) (iii) fgets( ) (iv) feof( ) (v) rewind( ) | 5M |