

Answer ONE Question from each Unit

All Questions Carry Equal Marks

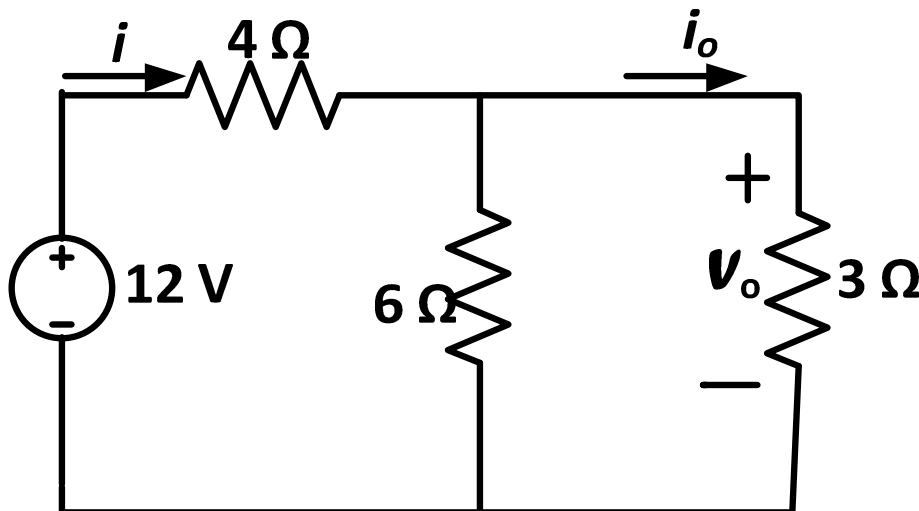
All parts of the Question must be answered at one place

UNIT-I

1. a) State and explain KVL and KCL 5M
- b) Explain the source transformation used in electrical network with suitable examples. 5M

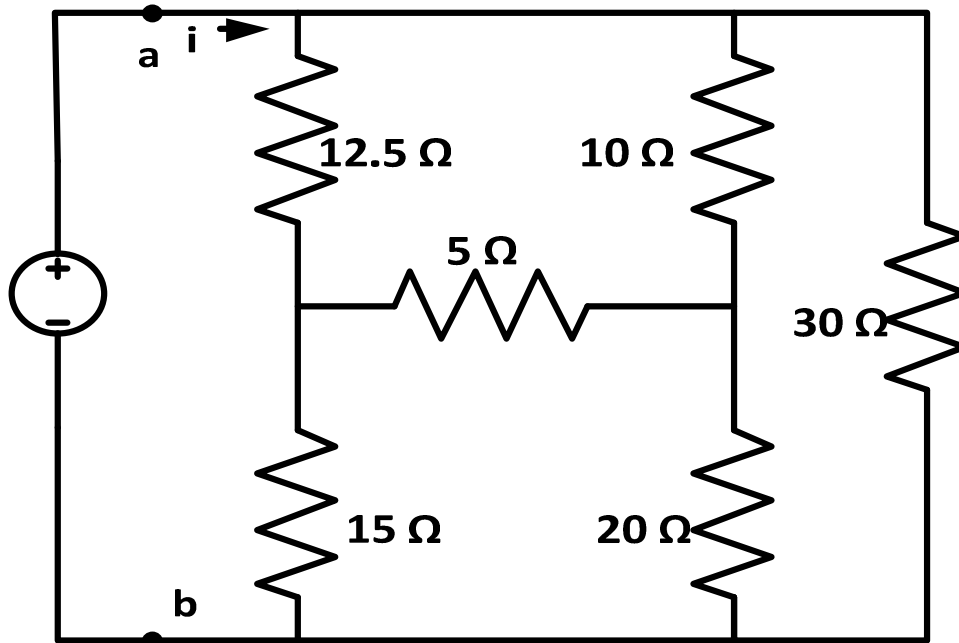
(OR)

2. a) Explain about the Ideal and Practical Voltage sources with neat circuit diagrams. 5M
- b) Find v_o and i_o in the circuit shown in below Fig. Calculate the power dissipated in the 3Ω resistor. 5M



UNIT-II

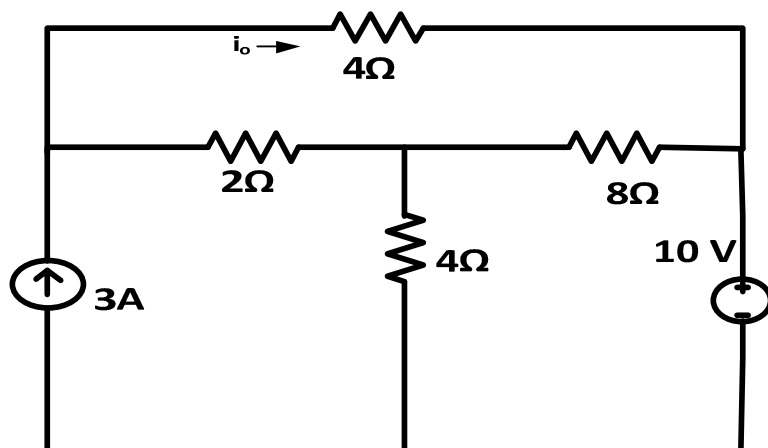
3. a) Obtain the equivalent resistance R_{ab} between 'a' and 'b' terminals for the circuit shown in Fig. below, by using star-delta transformation technique. Find the current i for the input voltage of 140 V. 5M



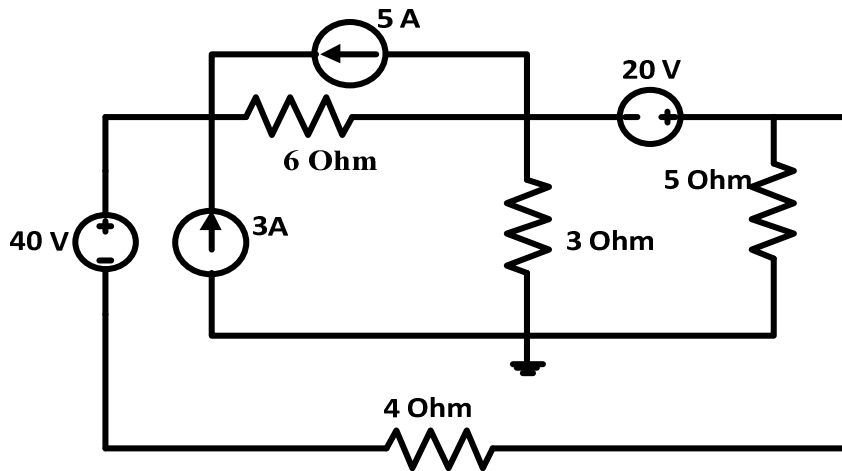
- b) Derive the expressions of equivalent resistances for converting a star network into a delta network. 5M

(OR)

4. a) Use mesh analysis to find the current i_o in the circuit of Fig shown in below. 5M



- b) Determine the power dissipated by 5Ω resistor for the circuit shown in Fig, by using Nodal Analysis.



UNIT-III

5. a) For an alternating waveform, define the following quantities with their units by giving one example.
- i) Instantaneous value
 - ii) Peak value
 - iii) Average value
 - iv) Frequency
 - v) Time period
- b) A coil having a resistance of 7Ω in series with an inductance of 31.8 mH is connected to 230 V , 50 Hz supply. Calculate
- (i) Circuit current
 - (ii) Phase angle
 - (iii) Power factor
 - (iv) Power consumed and
 - (v) Voltage drop across resistor and inductor.

(OR)

6. a) A saw tooth voltage wave increases linearly from 0 V to 200 V in the interval from 0 to 2 seconds. At $t=2$ seconds, its value drops to zero suddenly. The waveform repeats this pattern. Find the RMS value and average values of the voltage wave.
- b) A resistor R in series with a capacitor C is connected to 50 Hz , 240 V source. Find the value of C so that R absorbs 300 W and voltage across R is 100 V . Also find the maximum charge and the maximum stored energy in C .

UNIT-IV

7. a) Define the following 4M
- i) Reluctance
 - ii) Magneto motive force
 - iii) Magnetic field intensity
- b) A circular iron ring has a mean circumference of 1.5 m and a cross-sectional area of 0.01 m^2 . A saw-cut of 4 mm wide is made in the ring. Calculate the magnetizing current required to produce a flux of 0.8 mWb in the air gap if the ring is wound with a coil of 175 turns. Assume relative permeability of iron as 400 and leakage factor 1.25. 6M
- (OR)
8. a) Compare between magnetic and electrical circuits. 4M
- b) Derive the Expression for coefficient of coupling, K in magnetic circuits. 6M

UNIT-V

9. Explain construction of DC machine with the help of neat circuit diagram. 10M
- (OR)
10. a) Draw and explain the O.C.C internal and external characteristics of DC shunt generator. 5M
- b) A DC shunt generator has shunt field winding resistance of 100Ω . It is supplying a load of 5kW at a voltage of 250V. If its armature resistance is 0.22Ω , Calculate the induced e.m.f. of DC generator. 5M

UNIT-VI

11. a) A four pole DC Motor has lap connected armature winding. The flux per pole is 30 mWb. The number of armature conductors is 250. When connected to 230 V DC supply it draws an armature current of 40A. Calculate the back e.m.f. and the speed with which motor is running. Assume armature resistance is 0.6Ω . 5M
- b) Explain any one speed control method of a DC motor. 5M
- (OR)
12. a) Derive the expression for the electromagnetic torque developed in a DC Motor. 5M
- b) Write down the applications of DC series, shunt and compound motors. 5M

AR20

CODE: 20ESI102

SET-1

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

I B.Tech II Semester Supplementary Examinations, October-2022

PROGRAMMING FOR PROBLEM SOLVING

(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 in one place

UNIT-I

1. a) What is an Algorithm and Write an Algorithm to Calculate the Area(A) and Perimeter(P) of a Circle? 4M
- b) What is Operator Precedence and Explain about different types of operators in C. 6M

(OR)

2. a) Explain in detail about Program Development Steps. 5M
- b) Write about the C Tokens with suitable examples. 5M

UNIT-II

3. a) Write about nested if-else statements with the general form and a flow chart with suitable examples. 5M
- b) Write a C Program which reads three integers and prints the 2nd largest among them using if-else statements. 5M

(OR)

4. a) What is Branching? Explain the following. 4M
i). break ii). continue iii). goto
- b) Write the general form of the do-while loop. Write a C Program to evaluate the sum of the first n natural number using the do-while loop. 6M

UNIT-III

5. a) Write about the declaration and accessing of Two-Dimensional arrays with suitable examples. 5M
- b) Write a C Program for Matrix addition using the arrays. 5M

(OR)

6. a) Explain the following. 4M
i). Call by Value ii). Call by Reference
- b) Explain Dynamic Memory Allocation with an example program? 6M

UNIT-IV

7. a) Define Function? Explain types of functions. 4M
b) Write a C Program to find the GCD using the Non-Recursive Functions. 6M

(OR)

8. a) Define Recursion? Write a 'C' program to find the factorial of a given number using recursion. 5M
b) Write a C Program to Calculate the factorial of a given number using Non-Recursion. 5M

UNIT-V

9. a) Write about the definition, declaration, and accessing of structure members with suitable examples 6M
b) Explain array of structures with an example program. 4M

(OR)

10. a) What are the differences between structure and union? Give suitable example programs for each structure and union. 6M
b) Write a program to illustrate the method of sending an entire structure as a parameter to a function? 4M

UNIT-VI

11. a) Define a file and explain about reading, opening, and closing of a file with examples. 4M
b) Write a program to create a file with some numbers and read them from the file and display even and odd numbers separately. 6M

(OR)

12. a) Explain about 6M
i). ftell() ii). fseek() iii).rewind()
b) Write a C program to copy the content from one file to another file 4M

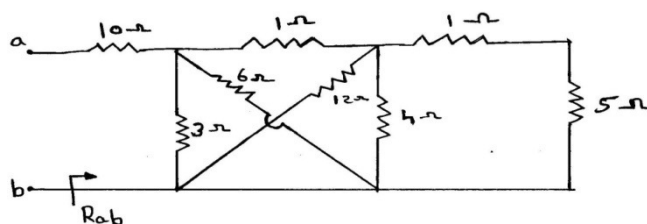
Answer ONE Question from each Unit

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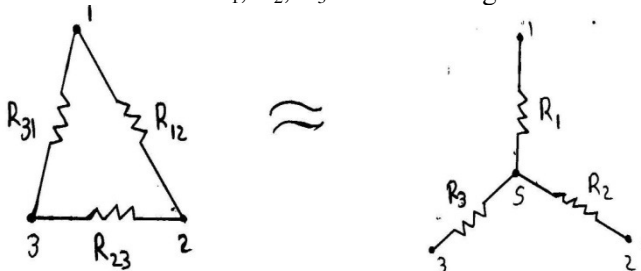
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UNIT-I

1. a) State and explain Kirchhoff Current Law with example. 6M
 b) Calculate the equivalent resistance R_{ab} in the circuit. 6M

**(OR)**

2. a) Derive resistance R_1 , R_2 , R_3 to transform given delta network to star network 6M



- b) Explain the difference between an ideal voltage source and a practical voltage source. 6M

UNIT-II

3. a) Explain RMS and average values of an alternating quantities. 6M
 b) Define (i) active power (ii) reactive power and (iii) apparent power 6M

(OR)

4. A series circuit consisting of a 10Ω resistance, $100\mu\text{F}$ capacitance and a 10 mH inductance is driven by a 50 Hz ac voltage source of maximum value 100 volts . Calculate (i) the equivalent impedance (ii) current in the circuit and (iii) the power factor of the circuit. 12M

UNIT-III

5. With a neat diagram explain about the construction of DC generator. 12M

(OR)

6. Discuss the various methods of speed control of a D.C motor. 12M

UNIT-IV

7. a) Derive the emf equation of a single phase transformer. 6M
 b) Explain how the efficiency of a single phase transformer can be calculated. 6M

(OR)

8. A $500/250\text{V}$, 10 KVA single phase 50Hz transformer gave the following details
 OC test (LV side): 250V , 3A , 200W
 SC test (HV side): 25V , 20A , 300W
 Determine the regulation and efficiency at full load and 0.8 lagging power factor. 12M

UNIT-V

9. Derive the torque and power expressions of 3 phase induction motor 12M

(OR)

10. Illustrate the constructional differences between squirrel cage and slip ring induction motors. 12M

AR18

CODE: 18EST102

SET-2

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

I B.Tech II Semester Supplementary Examinations, October, 2022

PROGRAMMING FOR PROBLEM SOLVING

(Common to EEE, ME 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 about functional block diagram of computer. 6M
b) List the basic data types, their sizes and range of values supported by C Language 6M
- (OR)**
2. a) Discuss about compilation and execution of c program. 6M
b) Explain about conditional and relational operator in c 6M

UNIT-II

3. a) Write a C program to find reverse of a number for eg 123 o/p:321 6M
b) Explain about various unconditional statements available in C language with suitable examples. 6M
- (OR)**
4. a) Write about switch statement with suitable example 6M
b) Explain about various iterative statements available in C language with suitable examples. 6M

UNIT-III

5. a) Write a C program to find length of a string with and without string handling functions 6M
b) Explain how to pass arrays to functions with example. 6M
- (OR)**
6. a) Write a C program to perform multiplication of two matrices. 6M
b) What is recursion? Write the difference between iteration and recursion. 6M

UNIT-IV

7. a) What is pointer? Explain how to initialize a pointer variable. List the advantages of pointers. 6M
b) Explain the syntax with suitable examples the dynamic memory allocation functions available in C? 6M
- (OR)**
8. a) Differentiate Static memory Allocation and Dynamic Memory Allocation. 6M
b) Write a 'C' program to illustrate the use of pointers in arithmetic operations. 6M

UNIT-V

9. a) Explain the following with examples: fgetc(), fputc(), fscanf() 6M
b) Define structure? Write a sample program to demonstrate the structure student. 6M
- (OR)**
10. a) Write a program to create a file with some integers and read the numbers from the file and display even and odd separately. 6M
b) Differentiate Structure and Union 6M

AR18

CODE: 18ECT103

SET-2

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

I B.Tech II Semester Supplementary Examinations, October, 2022

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) Define the following terms in detail (i)ripple factor (ii)peak inverse voltage. (iii)efficiency (iv)transformer utilization factor (v)form factor (vi)peak factor 6M
- b) In a Half –wave rectifier an AC voltage of peak value 24V is connected in series with a silicon diode and load resistance of 480Ω , Find the peak current flowing through the diode 6M

(OR)

2. a) Draw the circuit diagram of Half-wave rectifier and derive the expressions for average value, R.M.S value and voltage drop across diode. 6M
- b) Derive the expression for a ripple factor in a full-wave rectifier with resistive load in detail 6M

UNIT-II

3. a) Draw and explain the ripple factor of full-wave rectifier with shunt capacitor filter in detail. 6M
- b) Give the list of different filters used in rectifier and their merits and demerits. 6M

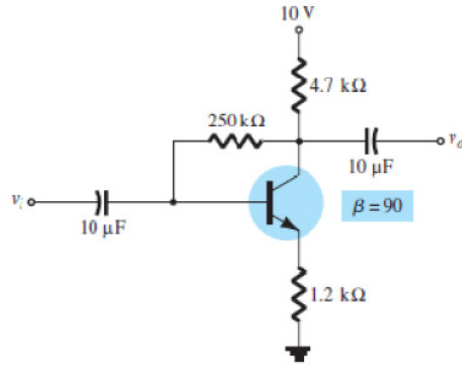
(OR)

4. a) Explain the working of transistor shunt regulator with neat diagram. 6M
- b) An L-C filter is to be used to provide a dc output with 1% ripple filter from a full-wave rectifier operating at 50Hz. Assume $L/C = 0.01$, determine the required values of L and C. 6M

UNIT-III

5. a) Explain how the fixed-bias establishes the stable operating point. 6M

- b) For the circuit shown below, determine I_B , I_C and V_{CE} . 6M



(OR)

6. a) Explain about diode compensation for V_{BE} and I_{CO} . 6M
 b) Define Thermal runaway. Derive the necessary condition to avoid thermal runaway in a transistor? 6M

UNIT-IV

7. Explain the comparison of low frequency analysis of transistor amplifier configurations. 12M

(OR)

8. a) Give the advantages of H-parameter analysis. 6M
 b) Explain in detail about the h-parameters using a two port network model. 6M

UNIT-V

9. a) Show that bandwidth increases in negative feedback amplifiers. 6M
 b) An amplifier has an input resistance of $200\text{ K}\Omega$, with certain negative feedback introduced in the above amplifier the input resistance is found to be $20\text{ M}\Omega$ and overall gain is found to be 1000. Calculate the loop gain and feedback factor. 6M

(OR)

10. a) Draw the circuit of a voltage series feedback amplifier and derive the expressions for R_{if} and R_{of} . 6M
 b) Draw the block diagrams of four types of negative feedback amplifier circuits and explain the advantages and disadvantages. 6M

**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

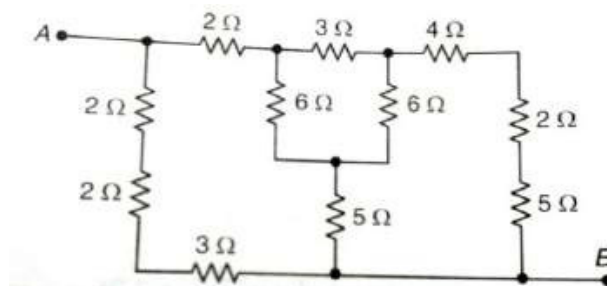
All parts of the Question must be answered at one place

UNIT-I

1. a. List the basic network elements? Write their volt-ampere relationship. 7M
- b. Two resistors of 40Ω and 60Ω in parallel are connected in series with two 0.5Ω resistors. Find the voltage across the series resistors and across the parallel resistors when 125 volt is applied to the entire circuit. 7M

(OR)

2. a. Calculate the effective resistance between the points A and B in the circuit shown in figure. 7M



- b. Explain how the current is divided in a parallel circuit? 7M

UNIT-II

3. a. Discuss the constructional details of DC Generator 7M
- b. A long-shunt compound generator delivers a load current of 50A at 500V and has armature, series field and shunt field resistances of 0.05Ω , 0.03Ω and 250Ω respectively. Calculate the generated voltage and the armature current. Allow 1 V per brush for contact drop. 7M

(OR)

4. a. Derive the torque equation for d.c. motor. 7M
- b. A 6 pole wave wound dc generator is having 50 slots with 25 conductors per slot and rotating at 1500 rpm. The flux per pole is 0.015 wb, calculate the emf generated? 7M

UNIT-III

5. a. Derive the E.M.F equation of Transformer 7M
- b. Explain how efficiency and regulation of a transformer are determined? 7M

(OR)

6. a. Discuss the principle of operation of induction motor. 7M
- b. Derive the torque equation for a induction motor. 7M

UNIT-IV

7. a. With a neat diagram explain the principle operation of alternator? 7M
- b. Derive the EMF equation of an alternator? 7M

(OR)

8. a. Explain the working of Repulsion type Moving iron Instrument 7M
- b. List the merits and demerits of PMMC instruments? 7M

UNIT-V

9. a. Explain the working of full-wave rectifier with neat waveforms 7M
- b. Differentiate between NPN and PNP junction transistors? 7M

(OR)

10. a. Explain the construction and working of P-N junction diode with a neat diagram 7M
- b. Explain the working of a PNP transistor 7M

AR16

CODE: 16CS1001

SET-1

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

I B.Tech II Semester Supplementary Examinations, October-2022

**COMPUTER PROGRAMMING
(Common to EEE & ECE)**

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) Write an algorithm and draw flowchart to find greatest among three given numbers. 7M
b) Explain about logical and bitwise operators with suitable examples. 7M
- (OR)
2. a) Define flow chart .Explain program development steps with neat diagram. 7M
b) Discuss about the structure of a C program with necessary steps and diagram/ 7M

UNIT-II

3. a) Define switch ..case statement. Write a program to find grades of n number of students using switch.. case. 7M
b) Write a program to print n Fibonacci numbers using while statement. 7M
- (OR)
4. a) Write syntax and structure of i) if..else ii) if ladder and discuss with examples. 7M
b) Write a program using for loop to find greatest of n numbers. 7M

UNIT-III

5. a) Define array. How to access array elements? Explain. 7M
b) Describe about storage classes in C. 7M
- (OR)
6. a) Explain about double dimensional array and write a program to find addition of 2 7M
matrices.
b) What is the difference between call by value and call by reference? Discuss the problems 7M
associated with them.

UNIT-IV

7. a) Write the procedure for swapping of two strings using pointers. 7M
b) Describe the process of deflation and, initializing a union with an example. 7M
- (OR)
8. a) Describe the two ways of accessing a structure member through a pointer. Explain the 7M
same with an example.
b) What is structure? Explain array of structures with example. 7M

UNIT-V

9. a) Explain about the functions for reading and writing data from a file. 7M
b) Write a C program to count the number of characters and number of lines in a file. 7M
- (OR)
10. a) Describe the process of handling errors during file operations. 7M
b) Write a C program to print file contents in reverse order. 7M