13EE1002 **AR13/SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, April-2017

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to MECH & CIVIL Branches)

Time: 3 hours **Max Marks: 70**

PART- A

Answer all questions [10 x 1=10M]

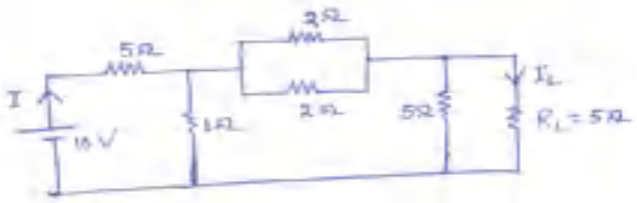
1. a) Write the expression of Energy stored in an Inductor?
   b) Write the voltage and current relation for a capacitor?
   c) List the operating characteristics of DC generator?
   d) Give the expression of efficiency of a DC motor?
   e) Define voltage regulation of Transformer?
   f) List any three features of induction motor?
   g) Write the equation of PMMC meter at equilibrium?
   h) What are the advantages of moving coil instruments over moving iron type?
   i) Sketch the V-I characteristics of si-diode?
   j) Sketch the circuit symbol of silicon controlled rectifier?

PART-B

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

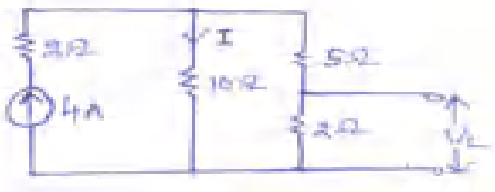
UNIT-I

2. a) Compare the power, energy and voltage-current relation in R, L, and C elements? **6M**
   b) Find the current I and I_L and the voltage across R_L shown in figure below? **6M**

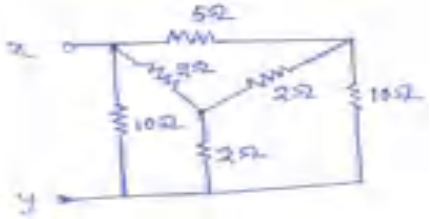


(OR)

3. a) Find the current in 10 Ω resistor and the voltage V_L shown in fig below? 4**M**



   b) Find the equivalent resistance across terminal x-y shown in fig. below? **3M**



   c) Derive the expressions of equivalent resistance star-delta transformation? **5M**

UNIT-II

4. a) Explain in detail about the operating characteristics of externally excited and compound DC generator? **8M**

   b) A 250 V, 4-pole, shunt motor has two circuit armature winding with 500 conductors. Thearmature circuit resistance is 0.25 Ω and field resistance is 125ohms. The flux per pole is 0.02 Wb. If the motor draws 14 A current from the mains, then find the speed and total torque developed in the motor? **4M**

(OR)

5. a) Describe various losses and their characteristics in DC motor in brief. Derive the expression for maximum efficiency of DC motor? **6M**

   b) Explain in detail about 3-point starter configuration connected to DC shunt motor. List its disadvantages? **6M**

UNIT-III

6. a) Explain the principle of an alternator and derive its emf equation? **6M**

   b) Discuss various tests performed in transformer? **6M**

(OR)

7. a) Describe the construction details and operation of induction motor? **6M**

   b) Explain the construction details and principle of transformer? **6M**

UNIT-IV

8. a) Discuss about PMMC instrument with neat sketch? **8M**

   b) List merits and demerits of moving iron type instruments? **4M**

(OR)

9. a) Discuss about attraction type moving iron instrument with neat sketch? **8M**

   b) Compare moving coil and moving iron type indicating instruments? **4M**

UNIT-V

10. a) Explain the V-I characteristics of Diode with a neat sketch? **6M**

    b) Derive the expression of output voltage for a half wave rectifier circuit? **6M**

(OR)

11. a) Explain different mode of operation of SCR? **6M**

    b) Explain the construction detail and operation of N-P-N Bipolar Junction Transistor? **6M**

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AR13

CODE: 13BS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, April-2017

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) The $(n+1)^{th}$ approximation of root of f(x) = 0 by Newton Raphson method is
   b) If $y = a_0 + a_1x + a_2x^2$ then the first normal equation is $\sum y_i$
   c) Write the relation between the operators E and D
   d) In Newton's forward difference interpolation formula the value of p lies between
   e) In which method successive approximations are used
   f) If $y^1 = f(x,y)$ then Euler's formula for $(n+1)^{th}$ iteration is
   g) Find the Laplace transform of $t e^{2t}$
   h) Find the inverse Laplace transform of $\frac{1}{s(s-2)}$
   i) Eliminate a and b from z = ax + by
   j) Write one dimensional heat equation

PART-B

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

UNIT-I

2. a) Find the root of the equation $xe^x = \cos x$ using the Regula –falsi method correct to four decimal places. [6 M]
   b) Find an approximate value of the real root of $x^3 - x - 1 = 0$ by bisection method. [6 M]

(OR)

3. a) Using Newton Raphson method find the root of the equation f(x)= $e^x - 3x = 0$ that lies between 0 and 1. [6 M]
   b) Find the straight line that best fits the following data by the method of least squares [6 M]

x :	1	2	3	4	5
y :	14	27	40	55	68

UNIT-II

4. a) From the following table, estimate the number of students who obtained marks between 40 and 45. [6 M]

Marks :	30 - 40	40 - 50	50 -60	60 -70	70 - 80
No. of students:	31	42	51	35	31

b) Find the interpolating polynomial from the following data [6 M]

x:	0	1	2	5
y:	2	3	12	147

(OR)

5. a) The population of a certain village in thousands is given in the following table. By using central forward difference formula estimate the village population in 1936. [6 M]

Year:	1901	1911	1921	1931	1941	1951
Population:	12	13	20	27	39	52

b) Evaluate $\int_0^{\pi} tsint\ dt$ using the Trapezoidal rule. [6 M]

UNIT-III

6. Solve $\frac{dy}{dx} = x^2 + y$ With y(0) = 2 by both Picard's method and Taylor's series method up to third degree terms and compute y(0.2) . [12M]

(OR)

7. Using Euler's modified method solve $\frac{dy}{dx} = x + \sin y$, y(0)=1 , compute y(0.2) and y(0.4) with h=0.2 **.** [12M]

UNIT-IV

8. a) Find the Laplace transformation of $\int_0^t \frac{e^t sint}{t}\, dt$ [6 M]

b) Evaluate the integral using Laplace transform $\int_0^{\infty} te^{-3t} sint\ dt$ [6 M]

(OR)

9. a) Find the inverse Laplace transform of $\frac{s-2}{s^2+5s+6}$ [6 M]

b) Using convolution theorem find the inverse Laplace transform of $\frac{1}{s^2(s+1)^2}$ [6 M]

UNIT-V

10. a) Form the partial differential equation by eliminating the arbitrary function from [6 M]
f($xy + z^2$, $x + y + z$) = 0

b) Solve $xp - yq = y^2 - x^2$ [6 M]

(OR)

11. a) Solve $z(x-y) = p x^2 - q y^2$ [6 M]

b) Solve $p - x^2 = q + y^2$ [6 M]

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AR13

Code: 13CS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I B.Tech II Semester Supplementary Examinations, April-2017

DATA STRUCTURES

(Common to CSE and IT)

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

PART – A

Answer all questions **[10 x 1=10M]**

1 a) Explain Time complexity?
b) Define Data Structures.
c) List the applications of queues.
d) State name of any four sorting techniques?
e) Give Postfix Expression of A+(B/C)-D.
f) Define depth and height of a tree.
g) What is meant by binary tree traversal?
h Define path in a graph?
i) What do you mean by breadth first search (BFS)?
j Define graph traversals.

PART – B

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

UNIT – I

2. a) Define non-linear data structure and give an example.
b) Write a program to find GCD of two numbers using recursion. [6M+6M]

(OR)

3. a) What is an algorithm? How do you analyze an algorithm?
b) What is difference between recursion and iteration. [6M+6M]

UNIT-II

4. a) Explain the stack operations with example.
b) Give advantages and disadvantages of circular and double linked lists. [6M+6M]

(OR)

5. a) Write about representation Queue using array.
b) State and explain different operations on single linked list. [6M+6M]

UNIT-III

6. a) Explain the difference between bubble sort and quick sort. Which one is more efficient?
b) Show step by step process in sorting number by Selection Sort.
56,57,92,38,44,90,61,73 . [6M+6M]

(OR)

7. a) Explain Insertion sort with suitable example.
b) Develop an algorithm for binary search. Validate the algorithm with a suitable data set. [6M+6M]

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Code: 13CS1002 **SET-1**

UNIT-IV

8. a) Explain about Binary Search Trees with a suitable example.
   b) Write an algorithm for in-order traversal of binary trees. [6M+6M]

(OR)

9. a) What is balanced binary tree? Explain with an example.
   b) Write algorithm to locate an element in binary search tree. [6M+6M]

UNIT-V

10. a) Explain the working of Depth-First search algorithm by taking suitable example ?
    b) Explain Dijkstra's shortest path algorithm with an example. [6M+6M]

(OR)

11. a) What is minimum spanning tree? How to find minimum spanning tree for a graph? Explain.
    b) Write an algorithm for finding the path between any two nodes of a graph? [6M+6M]

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