AR13 **Set-01**

Code: 13EE1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
I B.Tech II Semester Regular / Supplementary Examinations, May-2016
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE & ME Branches)

Time – 3 hrs **Max Marks: 70**

PART-A

Answer all questions **[10 x1=10M]**

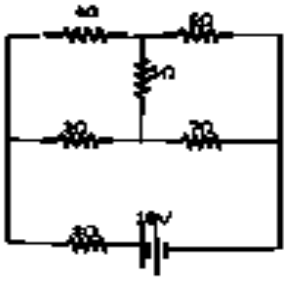
1. a) Define KCL and KVL.
   b) Draw the V-I Characteristics of a resistor.
   c) Write any two applications of a DC shunt motor.
   d) Principal of operation of DC motor.
   e) What are different losses in transformer?
   f) EMF equation of an alternator.
   g) Any two differences between MC and MI instruments.
   h) What is PMMC Instrument?
   i) Draw V-I characteristics of diode.
   j) Any two applications of SCR.

PART-B

Answer one question from each unit **[5 X12 =60M]**

UNIT- I

2. a) Calculate the current in 5Ω resistor shown in below figure (6+6)

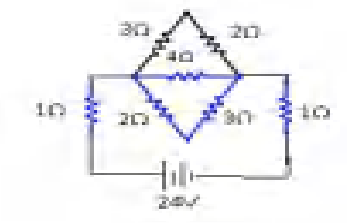


   b) State Kirchoff's laws and illustrate them with an example.

(OR)

3. a) Two coils connected in series have a resistance of 18Ω and when connected in parallel have a resistance of 4Ω. Find the value of resistances.
   b) Using star-delta transformation find the current I in the network shown below.

(6+6)



UNIT-II

4. a) Derive the EMF equation of a DC generator. (6+6)
   b) A 4 pole motor is fed at 440V and takes an armature current of 50A. The resistance of armature circuit is 0.28Ω. The armature winding is wave connected with 888 conductors and flux per pole is 0.023wbs. Calculate the speed of the motor.

(OR)

5. a) Explain the operation of a 3 point starter in a DC motor. (6+6)
   b) Classify DC generators and explain them in brief.

UNIT -III

6. a) Explain the principle of operation of a single phase transformer. (6+6)
   b) Explain Torque –Slip characteristics in a three phase induction motor.

(OR)

7. a) Derive the EMF equation of an alternator. (6+6)
   b) State and explain different losses in a single phase transformer.

UNIT- IV

8. a) Classify and explain the different types of Electrical Instruments. (4+8)
   b) Explain the principle and operation of moving coil instrument.

(OR)

9. a) Explain the principle of operation of Indicating Instrument. (6+6)
   b) Explain in brief the principle of operation of Moving Iron Instrument.

UNIT -V

10. a) Explain the principle of operation of P-N junction diode. (6+6)
    b) Explain in detail regarding half wave rectifier with a neat sketch.

(OR)

11. a) Describe the characteristics of SCR. (6+6)
    b) State the applications of diode and SCR.

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13BS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech II Semester Regular / Supplementary Examinations, May-2016
ENGINEERING MATHEMATICS-II
(Common to EEE & ECE)

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

PART-A

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

1 a) The Bisection method for finding root of an equation f(x)=0 is
b) The order of convergence of Newton-Raphson method is_____
c) If $f(x)=8x^3 - 2x^2+1$, then $\Delta^3 f(x) =$ _____
d) Lagrange's Interpolation formula states that
e) The disadvantage of Picard's method is
f) In fourth order R-K method y_1 =
g) Miline's predictor formula is
h) Inverse Laplace transform of $(S+2)^{-2}$ is _____
i) Laplace transform of $t^4 e^{-at}$ is
j) The solution of $\frac{\partial^2 z}{\partial y^2} = \sin(xy)$ is

PART-B

Answer one question from each Unit **[5 x 12=60M]**

UNIT-I

2 a) Find a real root of the equation $x^3 - 2x - 5 = 0$ by method of false position correct to 3 decimal places [6 M]

b) Find the root of the equation $xe^x = \cos x$ using the regular-falsi method correct to 4 decimal places [6 M]

(OR)

3 a) Using Newton iterative method, find the real root of $x \log_{10} x = 1.2$ correct to 5 decimal places [6 M]

b) Using the method of least squares fit a relation of the form $y=ab^x$ to the following data [6 M]

x	2	3	4	5	6
y	144	172.8	207.4	248.8	298.5

UNIT-II

4 a) Evaluate (i) $\Delta \tan^{-1} x$ (ii) $\Delta(e^x \log 2x)$ (iii) $\Delta(x^2/\cos 2x)$ (iv)$\Delta^2 \cos 2x$ [6 M]

b) From the following tables 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

(OR)

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13BS1002 **SET-1**

5 a) Apply Lagrange's formula to evaluate the value of f(31) ,given that f(30)= -30, f(34)= -13 f(33)=3 and f(42)=18. [6 M]

b) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using trapezoidal rule [6 M]

UNIT-III

6 a) Find by Taylor's series method the value of y at x=0.1 and x=0.2 to five places of decimals from $\frac{dy}{dx} = x^2y-1$, y(0)=1 [6 M]

b) Obtain Picard's second approximate solution of the initial value problem $y^1=x^2(y^2+1)$, y(0)=0 [6 M]

(OR)

7 a) Apply Euler's method to solve $y^1= (x + y)$, y(0)=0 choosing the step length = 0.2 (carryout 6 steps) [6 M]

b) Using Range-Kutta method of 4th order solve $\frac{dy}{dx} = \frac{y^2-x^2}{y^2+x^2}$ with y(0)=0 at x=0.2, 0,4 [6 M]

UNIT-IV

8 a) Find the Laplace transform of $\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^3$ [6 M]

b) Find Inverse Laplace transform of (i) $\frac{1}{s^3-a^3}$ (ii) $\frac{s^3}{s^4-a^4}$ (iii) $\frac{s}{(s^2-1)}$ [6 M]

(OR)

9 a) Evaluate (i) $\int_0^\infty \sin 2t \ \delta\left(t - \frac{\pi}{4}\right) dt$ (ii) $L(\frac{1}{t}\delta(t-\alpha))$ [6 M]

b) Solve $(D^2 + 4D + 5)y = 5, \quad y(0) = y'(0) = 0$ [6 M]

UNIT-V

10. a) Solve $\frac{\partial^3 z}{\partial x^2 \partial y} + 18xy^2 + \sin(2x - y) = 0$ [6 M]

b) Solve $\frac{\partial^2 z}{\partial x^2} + z = 0$, given that when x = 0 , $z = e^y$ and $\frac{\partial z}{\partial x} = 1$ [6 M]

(OR)

11. a) Solve $\frac{y^2 z}{x} p + x^2 zq = y^2 x$ [6 M]

b) Solve $(x^2 - y^2 - z^2)\, p + 2xyq = 2xz$ [6 M]

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AR13 **Set-01**

Code No: 13CS1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I B.Tech. II Semester Regular / Supplementary Examinations, May-2016
DATA STRUCTURES
(Common to CSE and IT)

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

PART –A

Answer All Questions **[10X1 =10M]**

1. a. Define Recursion.
   b. What is Linear Data Structure? Give an Example.
   c. What are various applications of Stacks?
   d. Define Binary Search.
   e. What is the Best Time Complexity of Merge Sort?
   f. What are balanced Binary Trees.
   g. Define Adjacency List.
   h. Define DFS.
   i. Define Minimum Spanning Tree.
   j. Define Circular Linked List.

PART – B

Answer One Question from Each Unit **[5X12 =60M]**

UNIT -I

2. What is an Algorithm? How can you analyse an Algorithm and its Complexity. Explain with an example. 12M

(OR)

3. What is Recursion? Explain Linear and Binary Recursion with examples. 12M
   Definition of Recursion: 2M

UNIT – II

4. Define Linked list. Explain about Insertion and Deletion in Linked Lists. 12M

(OR)

5. Define Stack. Explain various operations on Stacks. 12M

UNIT – III

6. a. Write Algorithm for Quick Sort and Explain with an Example. 6M
   b. Derive the Time Complexity for Quick Sort. 6M

(OR)

7. a. Write Algorithm for Linear Search and Explain with an Example. 6M
   b. Explain Insertion Sort with an example. 6M

UNIT – IV

8. a. What is Binary Tree? Explain the operations performed on binary tree. 6M
   b. Explain In-Order, Pre – Order and Post – Order Tree Traversals. 6M

(OR)

9. Explain the operations performed on Binary Search Tree. 12M

UNIT – V

10. a. Define Non Linear Data Structures. Explain in detail the representation and storage of graphs. 6M
    b. Write DFS Algorithm with example. 6M

(OR)

11. a Explain the operation performed on graph . 6M
    b Explain BFS with example 6M

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