

CODE: 13EE1002

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONOMOUS)

I.B.Tech. II Semester Supplementary Examinations, August-2015
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(Common to CE & ME Branches)

TIME: 3 Hr

Max.Marks:70

PART-A

Answer All Questions

[10 X 1M= 10M]

- 1)
 - a) Define Ohm's Law.
 - b) Explain Kirchhoff's Current Law.
 - c) What is the main precaution to start DC Series Motor?
 - d) What is the necessity of D.C Starter?
 - e) Why Transformer rating measured in KVA?
 - f) Define Slip in Induction Motor.
 - g) State any two advantages of PMMC instrument.
 - h) Write the classification measuring Instruments.
 - i) Define PIV.What is its value for bridge rectifier?
 - j) Mention some applications of SCR?

PART-B

Answer One Question from each unit

[5X12M=60M]

UNIT-I

- 2) a) For the resistive network shown in Fig.1. Find the equivalent resistance seen by the source.
Where $R_1=5$, $R_2=10$, $R_3=2$, $R_4=5$, $R_5=6$, $R_6=2$, $R_7=2$, $R_8=2$.

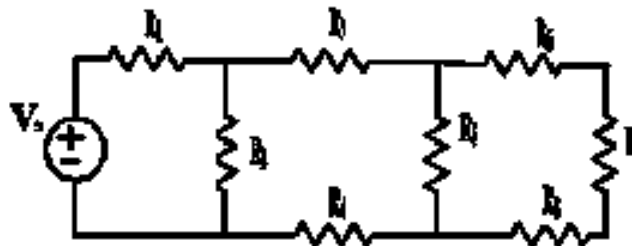


Fig.1

- b) Explain about Resistance, Inductor and Capacitor parameters.

[8M+4M]

(OR)

- 3) a) In Fig.2. Determine the equivalent resistance by using Star-Delta Transformation.

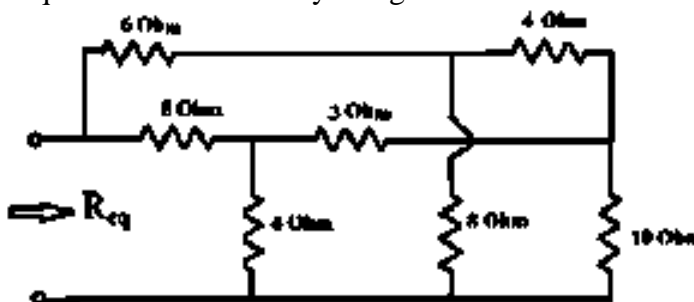


Fig.2

- b) The current in the 5 Ω resistance of the circuit shown in Fig.3. is 5 Amperes. Find the current in the 10 Ω Resistor. Calculate the power consumed by the 5 Ω resistor. [7M+5M]

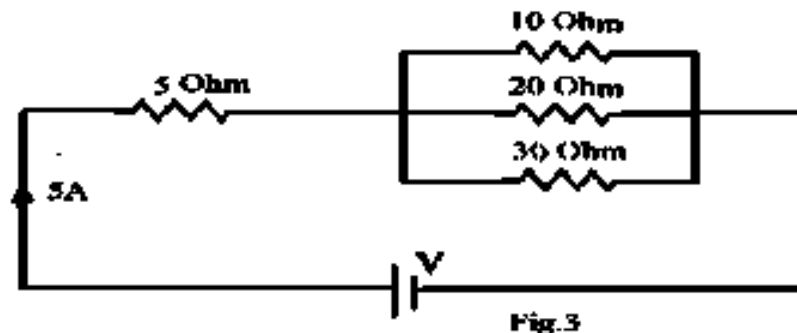


Fig.3

UNIT-II

- 4) a) Explain the Characteristics of DC Generators? [4M+8M]
 b) A Separately excited generator running at 1500 rpm supplies 250 Amp at 125 Volts to a circuit of constant resistance. What will the current be when the speed is dropped to 1200 rpm with the field current unaltered? The armature resistance is 0.05 Ω and the total drop at the brushes is 1.5V. Ignore armature reaction.
- (OR)
- 5) a) Explain the Characteristics and Applications of DC Motors? [6M+6M]
 b) A Shunt machine, connected to a 200V mains, has an armature resistance (including brushes) of 0.15 Ω and the resistance of the field circuit is 100 Ω . Find the ratio of its speed as a generator to its speed as a motor, the line current in each case being 75 Amp.

UNIT-III

- 6) a) Derive the E.M.F equation of a Transformer. [5M+7M]
 b) A Three-phase induction motor is wound for four poles and supplied from a 50-Hz supply. Calculate (i) the Synchronous speed, (ii) the speed of the rotor when the slip is 3% , and (iii) the rotor frequency when the speed of the rotor is 900rpm.
- (OR)
- 7) a) A 10-KVA, 6600/220V, 50Hz transformer is rated at 2.5 V/turn of the winding coils. Assume the transformer to be ideal and calculate (i) step-up transformation ratio, (ii) step-down transformation ratio, (iii) the total turns of the high –voltage and low –voltage coils, (iv) the primary current as a step-down transformer, and (v) the secondary current as a step-down transformer.
 b) Explain the principle of operation of Alternator with neat sketches. [7M+5M]

UNIT-IV

- 8) Describe the working principle of a moving coil permanent-magnet Instrument with neat sketches. 12M
 (OR)
- 9) a) Why PMMC instruments cannot be used for A.C. measurements? [6M+6M]
 b) Explain the various errors in the moving iron instruments.

UNIT-V

- 10) What is rectification? Describe the working of a half-wave rectifier circuit and derive the average and rms values of the output wave. 12M
 (OR)
- 11) a) Draw the V-I characteristics and symbol of P-N Junction diode with details. [6M+6M]
 b) Explain the Transistor in CE, CB and CC configurations

Code : 13BS1002

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

I B.Tech II Semester Supplementary Examinations, August-2015

ENGINEERING MATHEMATICS – II

(Common to EEE & ECE)

Time : 3 Hours

Max. Marks : 70

PART-A

Answer all questions

[10 X 1 = 10 M]

1. a) Write the Newton-Raphson iterative formula to find the n^{th} root of a number.
- b) Write the normal equations to fit a straight line of the form $y = a + bx$.
- c) Show that $\Delta \nabla = \Delta - \nabla$
- d) Write Simpson's $3/8^{\text{th}}$ rule formula.
- e) Write Newton Backward interpolation formula.
- f) Write the formula used in Picard's method.
- g) Find $L[t.e^{2t}]$
- h) Find $L^{-1}\left[\frac{2+3s}{s^3}\right]$
- i) Form the partial differential equation by eliminating arbitrary constants a and b in

$$z = (x - a)^2 + (y - b)^2 + 1$$
- j) Solve $z = px + qy + \sqrt{p^2 - q^2}$..

PART-B

Answer one question from each unit

[5 X 12 = 60 M]

UNIT - I

2. a) Find a positive root of $x^3 - x - 1 = 0$ correct to two decimal places by Bisection method
- b) Find a real root of $x \log_{10} x = 1.2$ by Newton-Raphson method, correct to three decimal places.

[6M + 6M]

(OR)

3. a) Solve $x^3 = 2x + 5$ for a positive root by iteration method.
- b) Fit an exponential curve of the form $y(x) = a.e^{bx}$ to the following data.

x	1	2	3	4	5
y	2.6	3.3	4.2	5.4	6.9

[6M + 6M]

UNIT - II

4. For the following data extrapolate the value of y at 0.3 and 1.2 by using Newton Forward and Backward difference formula

x	0.2	0.4	0.6	0.8	1.0
y	3.1224	3.2499	3.3825	3.5205	3.6642

[12M]

(OR)

5. a) find the interpolating polynomial $f(x)$ from the following table using Lagrange's interpolation method.

x	0	1	4	5
f(x)	4	3	24	39

- b) Evaluate $\int_0^2 e^{x^2} dx$ using Simpson's $1/3^{\text{rd}}$ rule by taking step size $h=0.25$. [6M + 6M]

UNIT - III

6. a) Using Taylor's series method, solve $\frac{dy}{dx} = x - y^2$, $y(0) = 1$, to find $y(0.1)$.

- b) Using modified Euler method, find $y(1.2)$ from $\frac{dy}{dx} = 2 + \sqrt{xy}$, $y(1) = 1$ taking $h=0.2$.

[6M + 6M]

(OR)

7. a) Solve $\frac{dy}{dx} = 2x - y$, with $y(1) = 3$ by Picard's method to find the solution for $x = 2$.

- b) Using Runge Kutta 4th order method find $y(1.2)$ from $y' = x - y$, $y(1) = 0.4$ taking $h = 0.2$. [6M + 6M]

UNIT - IV

8. a) Using Laplace transform, Evaluate $\int_0^\infty t^2 \cdot e^{-t} \cdot \sin t dt$

- b) Find $L^{-1} \left[\frac{s+4}{s^2-2s-3} \right]$ [6M + 6M]

(OR)

9. Solve the initial value problem by using Laplace transform $\frac{d^2 y}{dt^2} + 2 \frac{dy}{dt} + 5y = e^{-t} \cdot \sin t$ with $y(0)=0$, $y'(0)=1$. [12M]

UNIT - V

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

- b) Solve $(x - y)p + (y - x - z)q = z$ [6M + 6M]

(OR)

11. a) Solve $p^2 + pq = z^2$

- b) Use separation of variables method to solve $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} = 0$ [6M + 6M]

13CS1002**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****I B. Tech II Semester Supplementary Examinations, August-2015****DATA STRUCTURES
(Common to CSE and IT)****Time: 3 hours****Max Marks: 70****PART - A****Answer all questions****[10 x 1=10M]**

- 1
 - a) Define algorithm.
 - b) What is recursion?
 - c) What is stack overflow?
 - d) What is circular linked list?
 - e) What is the average time complexity of Merge Sort?
 - f) When the Worst case occur in linear search algorithm?
 - g) The maximum number of nodes on level i of a binary tree is?
 - h) What is BST?
 - i) What is adjacent vertex in a Graph?
 - j) What is cycle in a graph?

PART – B**Answer one question from each unit****[5X12=60M]****UNIT – I**

- 2
 - a) How a performance analysis of algorithm can be done? Explain with an example.
 - b) Write a program to print Fibonacci sequence using binary recursion.

(OR)

- 3
 - a) Discuss the recursive algorithm for towers of Hanoi problem.
 - b) State various asymptotic notations used for denoting time complexity.

UNIT – II

- 4
 - a) Discuss the algorithms for push and pop operations on a stack.
 - b) Write a program to implement queue using arrays.

(OR)

- 5
 - a) What is a linked list? Write any two merits of linked lists over arrays.
 - b) Write a program to implement stack using linked lists

UNIT – III

- 6
 - a) Give an algorithm for quick sort and explain its time complexity.
 - b) Write an algorithm for binary search and explain with a suitable data.

(OR)

- 7 a) Compare best, average, worst case time complexities of insertion sort, bubble sort, merge sort.
b) What is sorting? Explain about selection sort algorithm.

UNIT – IV

- 8 a) What is a binary tree? Differentiate a binary tree from a binary search tree.
b) Explain the process of displaying the nodes of a binary tree at a particular level.

(OR)

- 9 a) What is a binary search tree? Write an algorithm for inserting a node in a binary search tree.
b) What are balanced binary trees? Explain with an example.

UNIT – V

- 10 a) Explain the DFS technique in detail with an example.
b) Explain the Dijkstra's algorithm to find the minimum cost spanning tree with an example.

(OR)

- 11 a) Explain graph representation using adjacency matrix.
b) What is a digraph? Define in- degree and out-degree with respect to a digraph.