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Set-02

CODE: 13EE1002

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

I B.Tech II Semester Supplementary Examinations, October-2014

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 Power and Energy.
- b) What are the types of Network elements?
- c) What are the Applications of DC Motor?
- d) Write the E.M.F equation of DC Generator?
- e) What is the purpose of testing a transformer?
- f) How many number of slip rings having an Alternator?
- g) Write any two advantages of PMMC instruments.
- h) What are the types of moving iron Instruments?
- i) Define Transformer Utilization Factor (T.U.F)?
- j) Write the E.M.F equation of alternator?

PART-B

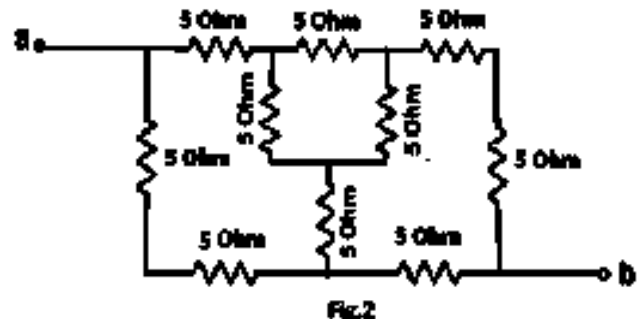
Answer One Question from each unit

[5X12M=60M]

UNIT-I

- 2) a) Derive the expression for energy stored in a Capacitor?
- b) Find a total inductance between A, B of a given circuit shown in figure-1.

[5M+7M]



- 3) a) Explain about Ideal and Practical Energy sources.
- b) Find R_{ab} across the terminals a-b of the network shown in Fig.2.

[5M+7M]

UNIT-II

- 4) a) Explain the principle of working of a DC Motor. [5M+7M]
b) Calculate the E.M.F.generated by a 6-pole lap wound armature with 65 slots and 12 conductors per slot, when driven at 1000r.p.m.The flux per pole is 0.02Wb.

(OR)

- 5) a) State the different types of DC Generators and state the applications of each type. [5M+7M]
b) A 250V DC shunt motor on no load runs at 1000r.p.m.and takes 5Amp.The total armature and shunt field resistances are 0.2 Ω and 250 Ω respectively.Calculate the speed when loaded and taking a current of 50 Amp if armature reaction weakens the field by 3%.

UNIT-III

- 6) Explain the synchronous impedance method for calculating the regulation of a three phase alternator. 12M

(OR)

- 7) A 400V,three-phase,8-pole,50Hz Induction motor draws a power of 2kw at no load and at rated voltage and frequency. At a full load slip of 3%,the power input to motor is 50 kw and stator ohmic loss is 1.5kw.Neglect I^2R loss at no load. If the stator core loss and mechanical losses are assumed equal, then at a slip of 3%,calculate
(i)Rotor ohmic loss (ii) Shaft power (iii) Shaft torque (iv) Internal Torque (v) Efficiency. 12M

UNIT-IV

- 8) Describe the working of a permanent magnet moving coil instrument with a neat sketch. Discuss the possible source of errors in such an instrument. 12M

(OR)

- 9) a) State the advantages and Disadvantages of moving iron instrument. [6M+6M]
b) Derive the equation for deflection in spring controlled PMMC instrument.

UNIT-V

- 10) a) Explain the principle of operation of NPN and PNP transistor. [6M+6M]
b) Explain the operation of CE configuration and also explain the input and output characteristics.

(OR)

- 11) Define average current, RMS current, DC output power, Rectifier efficiency, Ripple factor, peak inverse voltage, transformer utilization factor and regulation of full wave rectifier. 12M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I B.TECH II Semester Supplementary Examinations, October-2014

ENGINEERING MATHEMATICS-II
(Common to EEE & ECE branches)

Time: 3 hours

Max.Marks:70

PART-A

Answer all Questions

[10X1=10M]

- Write Newtons successive Iteration formula in general
- Form the normal equations for each constant to fit the straight line $y = a + bx$
- With usual notations, Show that $\mu = \frac{1}{2}(E^{1/2} + E^{-1/2})$
- State Simpsons one-third rule.
- Write Gauss backward interpolation formula.
- The Fourth order Runge-kutta Method Formula.
- Find the Laplace transform of $e^{2t}(\cos^2 t)$
- Write shifting property for inverse Laplace transforms.
- Eliminate the arbitrary function from $z = f(x^2 - y^2)$
- Write two dimensional heat flow equation in steady state.

Part-B

Unit-I

- Using Bisection method, find the root of $\sin x - \frac{1}{x}$ that lies between $x=1$ and $x=1.5$ (measured in radians)
- Fit a second degree parabola to the following data

X	1.0	1.5	2.0	2.5	3.0	3.5	4.0
Y	1.1	1.3	1.6	2.0	2.7	3.4	4.1

[6M+6M]

(OR)

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3. a) Using Newtons successive iterative method, find the real root of $\log_{10} x = 1.2$ correct to five decimal places
- b) An experiment gave the following values

v(ft./min.)	350	400	500	600
t(min)	61	26	7	26

It is known that v and t are connected by the relation $v = at^b$. Find the best possible values of a and b [6M+6M]

Unit-II

4. a) Prove with the usual notations, that

i) $\frac{1}{E} = \frac{1}{E^*} + \frac{1}{E^*} \text{ and } \frac{1}{E} = 1 - E^{-1}$

ii) $\delta = E^{1/2} - E^{-1/2} \text{ and } E = \delta^2$

iii) $\Delta = EV - VE = \delta E^{1/2}$

- b) Find the cubic polynomial which takes the following values using Lagranges interpolation method.

x	0	1	2	3
f(x)	1	2	1	10

Hence evaluate f(4) [6M+6M]

(OR)

5. a) A slider in a machine moves along a fixed straight rod. Its distance x cm., along the rod is given below for various values of the time t sec. Find the velocity of the slider and its acceleration when t=0.3 sec.

T	0	0.1	0.2	0.3	0.4	0.5	0.6
X	30.13	31.62	32.87	33.64	33.95	33.81	33.24

- b) Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using

i) Trapezoidal rule

ii) Simpsons 3/8 th rule.

[6M+6M]

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Unit-III

6. a) Find the value of y for x=0.1 by Picards method, given that

$$\frac{dy}{dx} = \frac{y-x}{y+x}, y(0) = 1$$

- b) Using Modified Euler's method, find approximate value of y at x=0.3, given that $\frac{dy}{dx} = x + y$ and y=1 when x=0

[6M+6M]

(OR)

7. a) Apply Runge-Kutta method to find an approximate value of y at x=0.2

in steps of 0.1, if $\frac{dy}{dx} = x + y^2$, given that y=1 when x=0

- b) Apply Euler's method, find an approximate value of y corresponding to

x=1, h=0.1, given that $\frac{dy}{dx} = x + y$ and y=1 when x=0

[6M+6M]

Unit-V

8. a) Evaluate i) $L\left[\int_0^x e^{-t} \sin t \, dt\right]$ ii) $L[t e^{-t} \sin 3t]$

- b) Evaluate $\int_0^\infty \frac{\sin t}{t} \, dt$ by using Laplace transform

[6M+6M]

(OR)

9. a) Find the inverse Laplace transform of $\frac{s}{s^4 + 4s^2}$

- b) Using Convolution theorem, find the inverse Laplace transform of

$$\frac{s}{(s^2+1)(s^2+4)(s^2+9)}$$

[6M+6M]

Unit-V

10. a) Form the Partial differential equation by eliminating arbitrary

function from $f(x^2 + y^2, z - xy) = 0$

- b) Solve $(x^2 - y^2 - z^2)p + 2xyz = 2xz$

[6M+6M]

(OR)

11. a) Solve $x^2(y - z)p + y^2(z - x)q = z^2(x - y)$

- b) Solve $q^2 = z^2 p^2 (1 - p^2)$

[6M+6M]

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

I B.Tech II Semester Supplementary Examinations, October -2014

**DATA STRUCTURES
(Common to CSE and IT)**

Time: 3 hours

Max.Marks:70

PART –A

Answer All Questions

[10X1 =10M]

1. a) What is Space Complexity?
b) What is modular programming?
c) What is the Big Oh notation of Logarithmic time?
d) What is inserting and traversing in data structures?
e) Give Postfix Expression of $A+(B/C)-D$.
f) State full form of LIFO and FIFO.
g) State name of any four sorting techniques?
h) Construct binary search tree for 50,33,44,77,35,60,40.
i) What are the different ways to represent Graphs.
j) What is spanning tree of a Graph?

PART – B

Answer one question from each unit

[5X12=60M]

Unit – I

2. a) What are the advantages and disadvantages of recursion?
b) Write a program to print Reverse of a number using recursion? **[6M+6M]**
- (OR)
3. a) What are the different ways to design algorithm?
b) What is data structures and define different types of it? **[6M+6M]**

Unit-II

4. a) List out applications of Stack with examples.
b) Write an algorithm in C to perform push and pop operations. **[6M+6M]**
- (OR)
5. a) How is the queue different from stack.
b) Write a C program to merge two linked list. **[6M+6M]**

Unit-III

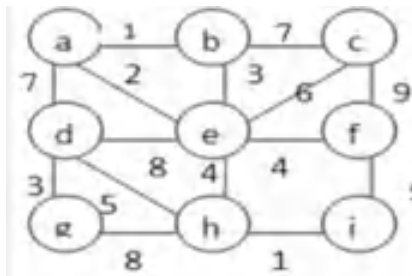
6. a) Analyze the time complexity of Merge Sort with example.
b) Show step by step process in sorting number by Selection Sort
56,57,92,38,44,90,61,73 . **[6M+6M]**
- (OR)
7. a) Explain the basic principle of bubble Sort with example .
b) Write a C program to implement the insertion sort. Analyze its timing requirement. **[6M+6M]**

Unit-IV

8. a) Define the following terms in Graph
 a)degree b)depth c)path d)Forest
 b) List the operations to be performed on a binary tree each with an example. [6M+6M]
 (OR)
9. Suppose a binary tree T is in the memory. Write a C algorithm for each of the following:
 1) Finding the number of nodes in the T.
 2) Finding the depth D of T.
 3) Finding the number of terminal nodes in T. [12M]

Unit-V

10. a) Explain the Kruskal's algorithm. Find out minimum spanning tree for the following graph.



- b) Write depth first search algorithm. [6M+6M]
 (OR)
11. a) Explain Dijkstra's shortest path algorithm with an example.
 b) Discuss the characteristics of the adjacency matrix and adjacency list implementations for a graph.. [6M+6M]