Rajarambapu Institute of Technology, Rajaramnagar
(An Autonomous Institute)

Enrol. No	

First Year M.Tech.Electrical (SEMESTER – II) Examination, March.2012. **MM076**

Power System Dynamics (EE-504)

Day & Date: Tuesday, 20/03/2012 **Time: 03.00am to 05.00pm** **Max Marks- 50**

Instructions :
1. *Figures to the right indicates full marks*
2. *Draw neat sketches wherever necessary*

Q 1 a) Derive critical clearing time using equal area criterion. 08

b) Find the expressions for stator self-inductances 08

Q 2 a) Derive the voltage equations of stator and rotor from the p.u. inductances 08

b) Obtain the representation of synchronous machine under steady state 08

Q 3 a) What are the assumptions for large scale studies and explain them 10

b) Derive the constant flux linkage model of a synchronous machine 08

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First Year M.Tech. Electrical (SEMESTER –II) Examination, March.2012. **MM087**

Power System Optimization Techniques (EE-506)

Day & Date: Wednesday, 21/03/2012
Time: 03.00pm to 05.00pm **Max Marks- 50**

Instructions : *1) Attempt any TWO from each question*
2) Use non-programmable calculator only

Q 1 a) Suppose $f(X) = -x_1^3 - 2x_2^2 + 10x_1 - 6 - 2x_2^3$ 08
Subject to $\mathbf{g_1 = 10 - x_1x_2 \geq 0}$; $\mathbf{g_2 = x_1 \geq 0}$; $\mathbf{g_3 = 10 - x_2 \geq 0}$
Check for Kuhn -Tucker necessary and Sufficient conditions.

b) Using Lagrange multiplier method. Minimize, $(X) = x_1^2 + x_2^2 + x_3^2$; Subject to 08
$x_1 + x_2 + 3x_3 - 2 = 0$

$$5x_1 + 2x_2 + x_3 - 5 = 0$$

c) Find the maximum of $f(X) = 2x_1 + x_2 + 10$ subject to $g(X) = x_1 + 2x_2^2 = 3$ 08

Q 2 a) Solve following linear programming problem. 08
Maximize, $z = 4x_1 + 6x_2$;
subject to
$-x_1 + x_2 \leq 11$; $x_1 + x_2 \leq 27$; $2x_1 + 5x_2 \leq 90$; $x_1 \geq 0, x_2 \geq 0$,

b) Find minimum of $f = x^5 - 5x^3 - 20x + 5$ by cubic interpolation method 08

c) Find minimum of $f(x) = x(x - 1.5)$ by starting from 0.0 with initial step size of 0.05. 08
Use unrestricted search method.

Q 3 a) Solve following equation with steepest decent method for THREE iterations with 09
starting point $X_1 = \binom{5}{1}$
$f(X) = 0.5x_1^2 + 2.5x_2^2$

b) Solve following equation with **Newton method** for THREE iterations with starting point $X_1 = \binom{0}{0}$

$$f(X) = x_1 - x_2 + 2x_1^2 + 2x_1x_2 + x_2^2$$ 09

c) Using interior penalty method, 09
Minimize, $f(x_1, x_2) = \frac{1}{3}(x_1 + 1)^3 + x_2$
Subject to $g(x_1, x_2) = -x_1 + 1 \leq 0$
$g(x_1, x_2) = -x_2 \leq 0$

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Rajarambapu Institute of Technology, Rajaramnagar
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First Year M.Tech. Electrical (SEMESTER –II) Examination, March.2012. **MM097**

Elective-II Energy Management & Energy Audit (EE-510)

Day & Date: Thursday, 22/03/2012
Time: 03.00pm to 05.00pm **Max Marks- 50**

Instructions :
1. *Figures to the right indicates full marks*
2. *Draw neat sketches wherever necessary*

Q 1 a) Differentiate between Energy Conservation and Energy Efficiency? (8)

b) Explain some of the long-term energy strategies available for the better energy secured nation?

OR

Describe the merits of using steam in industries (8)

Q 2 a) What are the base line data that an audit team should collect while conducting detailed energy audit? (8)

b) Distinguish between 'preliminary energy audit' and 'detailed energy audit'? (10)

Q 3 a) Write down the steps involved in 'Energy management Strategy'? **(EA)** (8)

b) Why Sankey diagram is useful in energy balance calculations? (8)

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First Year M.Tech. Electrical (SEMESTER – II) Examination, March.2012. **MM107**

Elective-III Distribution System Engineering (EE-512)

Day & Date: Saturday, 24/03/2012
Time: 03.00pm to 05.00pm **Max Marks- 50**

Instructions :
1. *Figures to the right indicates full marks*
2. *Draw neat sketches wherever necessary*

Q 1 a) Explain the primary feeder arrangement from reliability point of view ? discuss the arrangements with suitable diagram (8)

b) Explain briefly a " distribution system" ?

OR

What is the importance of % voltage drop in feeders lines? What are the factors that affect % VD (8)

Q 2 a) How is the design of distribution system done? Discuss the factors that contribute for design (8)

b) A 500 m long single phase A C distributor has a total impedance of (0.02+ j 0.04) Ω and is fed from one end at 240 V. It is loaded as follows : 50 A at unity PF , 200 m from feeding point ; 100 A at 0.8 PF lagging , 300 m from feeding point ; 50 A at 0.06 PF lagging at the far end Calculate : 1) Total voltage drop 2) voltage at far end (10)

Q 3 a) How is the voltage level for distribution systems decided (8)

b) Write short notes on the following :

1) Ring main distributor 2) current distribution in 3-wire D C system. (8)