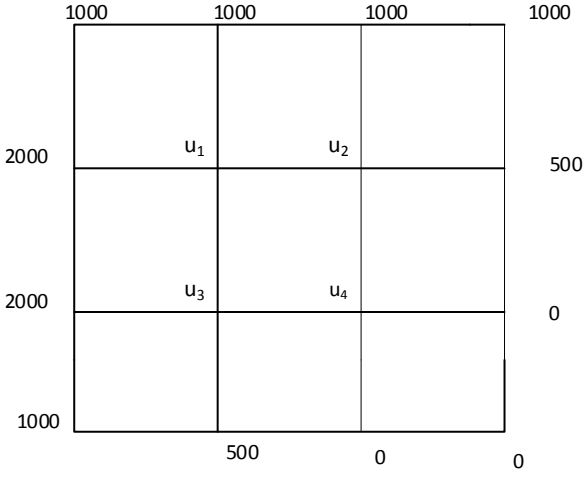
**IES COLLEGE OF TECHNOLOGY, BHOPAL**

M.E./ M.Tech.(1th SEM) Assignment -1

Advanced Mathematics (MEPS-101)

Units Cover-(I-II)

**Date of Assignment**:**18/09/2014** **Date of Submission:17/10/2014**

| | | |
|---|---|---|
| Q.1 | Using method of separation of variables, solve:<br>$$\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial x} + u$$<br>where, $u(x,0) = 6e^{-3x}$ | Mar., 2010 |
| Q.2 | Define binomial distribution. The probability the pen manufactured by a company will be defective is $\frac{1}{10}$. If 12 such pens are manufactured, find the probability that<br>a. Exactly two will be defective<br>b. At least two will be defective<br>c. None will be defective. | Mar. ,2010 |
| Q.3 | Find the solution of two- dimensional heat equation. | June, 2011 |
| Q.4 | Solve the elliptic equation $u_{xx} + u_{yy} = 0$ for the following square mesh with boundary values as shown:<br>  | Dec., 2010 |
| Q.5 | Find the Fourier transform of :<br>$$f(x) = \begin{cases} 1 \; for \; \lvert x \rvert < 1 \\ 0 \; for \; \lvert x \rvert > 1 \end{cases}$$<br>Hence evaluate:<br>$$\int_0^\infty \frac{\sin x}{x} dx$$ | Mar., 2010 |

**IES COLLEGE OF TECHNOLOGY, BHOPAL**

M.E. / M.Tech.(1th SEM) Assignment -1

Power System Dynamics Analysis (MEPS-102)

Units Cover-(I-II)

**Date of Assignment**:**18/09/2014** **Date of Submission:17/10/2014**

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|---|---|---|
| Q.1 | Discuss the relation between voltage stability to rotor angle stability<br>Min. words (400) | Dec., 2011 |
| Q.2 | Develop steady state model of synchronous generator. | Dec.,2011 |
| Q.3 | Simplify the representation of excitation model | Dec., 2011 |
| Q.4 | Define the following:<br>a. Voltage Stability<br>b. Voltage Collapse<br>c. Mid-term and long-term stability<br>Min. words (400) for each | March,2010 |
| Q.5 | Drive swing equation. | Dec., 2011 |

**IES COLLEGE OF TECHNOLOGY, BHOPAL**

M.E. / M.Tech. (1th SEM) Assignment -1

Advanced power Systems Projection Relay (MEPS-103)

Units Cover-(I-II)

**Date of Assignment**:**18/09/2014** **Date of Submission:17/10/2014**

| | | |
|---|---|---|
| Q.1 | Explain clearly the basic principle of operation of a differential relay. Explain its working for (i) an internal fault (ii) a through fault. | Dec., 2010 |
| Q.2 | In what ways the static relay has been successful in replacing the conventional electromagnetic relay? Min. words (400) | Dec ,2010 |
| Q.3 | Explain clearly the basic principle of operation of a differential relay and explain how the percentage differential relay overcome the drawback of simple differential relay and show that the slope of the simple differential relay characteristics is zero. | Dec., 2011 |
| Q.4 | What are the comparators? Discuss duality between amplitude and phase comparator. | March., 2010 |
| Q.5 | Discuss different types of amplitude and phase comparators | Mar., 2010 |

**IES COLLEGE OF TECHNOLOGY, BHOPAL**

M.E. / M.Tech.(1th SEM) Assignment -1

Power Electronics Application to Power System (MEPS-104)
Units Cover-(I-II)

**Date of Assignment**:**18/09/2014** **Date of Submission:17/10/2014**

| | | |
|---|---|---|
| Q.1 | Discuss the power capability curves of alternator. Explain how reactive power output of an alternator is restricted by capability curves? | Mar., 2010 |
| Q.2 | Developed the algorithm for formation of bus impedance matrix. | Mar.,2010 |
| Q.3 | What are the contingencies occurring in power system? Discuss in detail the contingency analysis of power system.<br>Min. words (400) | Mar., 2010 |
| Q.4 | Develop a mathematical model of an OLTC. | Dec.,2011 |
| Q.5 | Explain power system security. Discuss various levels of security with the help of flowchart. | Dec., 2011 |

**IES COLLEGE OF TECHNOLOGY, BHOPAL**

M.E./ M.Tech.($1^{th}$ SEM) Assignment -1

Advanced course in electrical machine (MEPS-105)

Units Cover- (I-II)

**Date of Assignment**:**18/09/2014** **Date of Submission:17/10/2014**

| | | |
|---|---|---|
| Q.1 | Explain the concept of speed and transformer voltage, invariance of power as applied to electrical machines. | Dec., 2011 |
| Q.2 | What is Kron's primitive machine? Write down the voltage equation of a Kron's primitive machine in the matrix form quoting the observation made. | Mar. ,2010 |
| Q.3 | Starting from primitive machine develop the voltage equations for a 3-phase induction motor and hence derive its equivalent circuit. | Dec., 2011 |
| Q.4 | Explain how park's transformations transform equations in a, b,c phase variables to d. q axes variables | March., 2010 |
| Q.5 | Develop an expression for torque of a single phase induction motor during its normal running condition using cross field theory. | Dec., 2011 |