M.TECH DEGREE EXAMINATION
Model Question Paper - I
First Semester
Branch: Electrical and Electronics Engineering
Specialization: 1. Power Electronics and Power Systems
2. Energy Systems
MEEPP 104 / MEEES 106-1 ADVANCED POWER SYSTEM STABILITY
(2013 admission onwards)

Time: Three Hours   Maximum: 100 Marks
All questions carry equal marks.

I (a) Develop the steady state equations and phasor diagrams, when the machine connected to an

Infinite bus with local load at machine terminal.

(i)   Resistive load
(ii)   Arbitrary load   (25 Marks)

OR

II (a) What is modified park transformation?

Let $v_a(t) = V_m \cos(\omega_R t + \alpha)$

$V_b(t) = V_m \cos(\omega_R t + \alpha - 2\pi/3)$
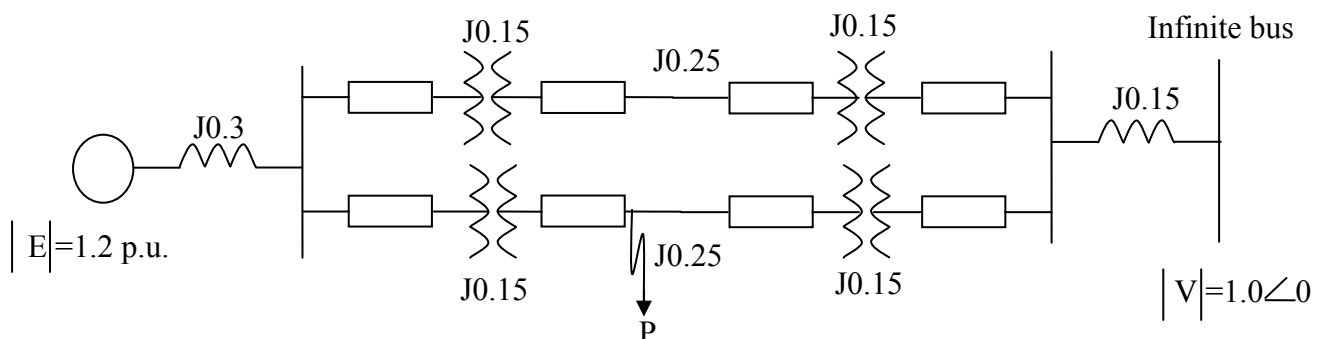
$V_c(t) = V_m \cos(\omega_R t + \alpha + 2\pi/3)$

Find the voltages v_d and v_q as related to the rms voltage V   (15 Marks)

(b) Explain the two axis model for a cylindrical rotor machine?   (10 Marks)

III (a) Find the critical clearing angle for the system shown for a three phase fault at the point P.

The generator is delivering 1.0 p.u power under pre-fault conditions.   (10 Marks)

(b) Explain the factors influencing transient stability. (10 Marks)

(c) Write note on transient energy function approach. (5 Marks)

OR

IV (a) What is power angle diagram? Explain clearly the equal area criterion for studying the transient stability of a power system. (10 Marks)

(b) Explain the numerical methods used for the analysis of transient stability. (15 Marks)

V (a) Explain in detail the eigen properties of the state matrix. How eigen values effect the stability of a system. (20 Marks)

(b) Write note on safety measures taken for to prevent voltage collapse. (5 Marks)

OR

VI (a) Explain small signal stability of a multi machine system. (20 Marks)

(b) Write notes on continuation power flow analysis. (5 Marks)

VII Write short note on.

        (i)   Fast valving technique for steam turbines
        (ii)   Dynamic breaking
        (iii)   Reactor control
        (iv)   Pole operation
        (v)   Power system stabilizer   (5 X 5 = 25 Marks)

OR

VIII (a) Explain the techniques for transient stability enhancement. (15 Marks)

(b) Explain voltage stability enhancement. (10 Marks)