Registration no: | | | | | | | | | | |

Total Number of Pages: 01

M.TECH

PPPC202

2nd Semester Back Examination 2016-17
POWER SYSTEM DYNAMICS
BRANCH(S): POWER ELECTRONICS AND POWER SYSTEMS
Time: 3 Hours
Max Marks: 70
Q.CODE:Z380

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

a) Define power system stability and rotor angle stability.
b) What are the examples of small transient disturbance and large transient disturbance?
c) Classify the different types of small signal stability due to insufficient damping of oscillation.
d) Draw the structure of a typical lumped-mass shaft system model.
e) What is Lyapunov's first method and Lyapunov's second method for stability analysis?
f) How can we determine stability of a system from eign value?
g) What is the value of transfer conductance used for analytical Lyapunov function construction?
h) Draw the potential energy well for a single machine infinite bus system.
i) What is voltage stability and voltage collapse?
j) What are the different sources caused damping of torsional oscillation?

Q2 a) Write the procedure for linearizing the equation $\dot{x}$ = f(x,u). (5)
b) Describe energy function formulation for a single machine infinite bus system. (5)

Q3 Describe torsional interaction with power system control. (10)

Q4 Write and explain different eign properties of the state matrix. (10)

Q5 a) Write the different steps used to compute critical clearing time. (5)
b) Draw and explain V_R~P_R characteristics curve and V_R~ Q_R curve for a simple radial system. (5)

Q6 a) Briefly explain small signal stability and Transient stability. (5)
b) With suitable circuit diagram for a simple radial system, plot and explain I, V_R &P_R. (5)

Q7 Describe turbine generator torsional characteristics. (10)

Q8 **Write short note on any two** (5 x 2)

a) Sub synchronous resonance (SSR).
b) Potential energy "well" for a single machine infinite bus system.
c) Critical energy computation methods.
d) Mid-term stability and Long term stability