NR/R09

Code No: B0705/D0704

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M.Tech II - Semester Examinations, March/April 2011

POWER SYSTEM RELIABILITY

(ELECTRICAL POWER SYSTEMS)

Time: 3hours **Max. Marks: 60**

Answer any five questions

All questions carry equal marks

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1. A Power System contains four generating units, where units 1, 2 and 3 have a capacity of 20MW and unit four has a capacity of 40 MW. The failure rate and the repair rate of each unit is 0 .4 per year and 9.6 per year respectively. Develop the combined capacity outage probability table. [12]

2. A generating unit consists of 2×25 & 1×50 MW units with a failure rate of 0.01 failures per day and repair rate 0.49 per day. Obtain the Cumulative Probability and Cumulative frequency of all the possible states. [12]

3. a) Explain Common mode failure of a power system network.
   b) What is the importance of security function and Explain its model with respect to reliability studies of power system? [6+6]

4. a) Define: (a) SAIFI (b) SAIDI(c)CAIDI and (d) ENS of a distribution system.
   b) With the help of state diagrams, explain the probability array method in two interconnected systems. [4+8]

5. a) What do you meant by overlapping forced outages and give two examples.
   b) Explain transient, active and passive failures in a distribution system with the help of state space & sequence diagrams. [4+8]

6. a) A system consists of two 4 MW units and one 6 MW unit with forced outage rates of .02. Develop the capacity outage probability table.
   b) Draw and explain the state space representation of a two-level load model. [6+6]

7. a) Discuss the effect of weather on the reliability of a transmission lines.
   b) Explain the modeling of generator using STPM approach. [6+6]

8. Write short notes on:
   a) Active and Passive failures
   b) Effects of limited and unlimited tie capacities on reliability of interconnected system. [6+6]

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