26+40

BE Electrical VIII CBSGS 30.5.17

(76)

Q.P. Code :17121

(Time: 3 Hours) [Total Marks :80]

Please check whether you have got the right question paper.

N. B.
(1) Question No. **1** is **compulsory.**
(2) **Attempt** any **three** questions out of remaining questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) **Assume** suitable **data** if **necessary.**

1. Attempt any **four** :- 20
   a) Explain Load growth characteristics in detail.
   b) Draw Bath Tub curve and define all three regions in it.
   c) State the objectives of system planning.
   d) Show that M.T.T.F. is reciprocal of failure rate λ.
   e) A system is to be designed with overall reliability of 0.96 using components having individual reliability of 0.6. What is the minimum number of components that must be connected in parallel.

2. a) Explain PJM method in detail. 10
   b) What is Load forecasting ? Describe different techniques used for load forecasting. 10

3. a) Differentiate in Short term, Medium term and Long term planning. 10
   b) What is reactive power planning? What are the methods used for reactive power planning? 10

4. a) Consider a system containing six units of 40 MW each with a forced outage rate of 0.03. Prepare the capacity outage table for the system. Find Loss of Load Expectation (LOLE) and risk factor if the annual peak load is 170 MW and base load is 40% of peak load. 10
   b) Derive a general expression for the unreliability of model shown in figure below and hence evaluate the unreliability of the system if all component have a reliability of 0.8. 10

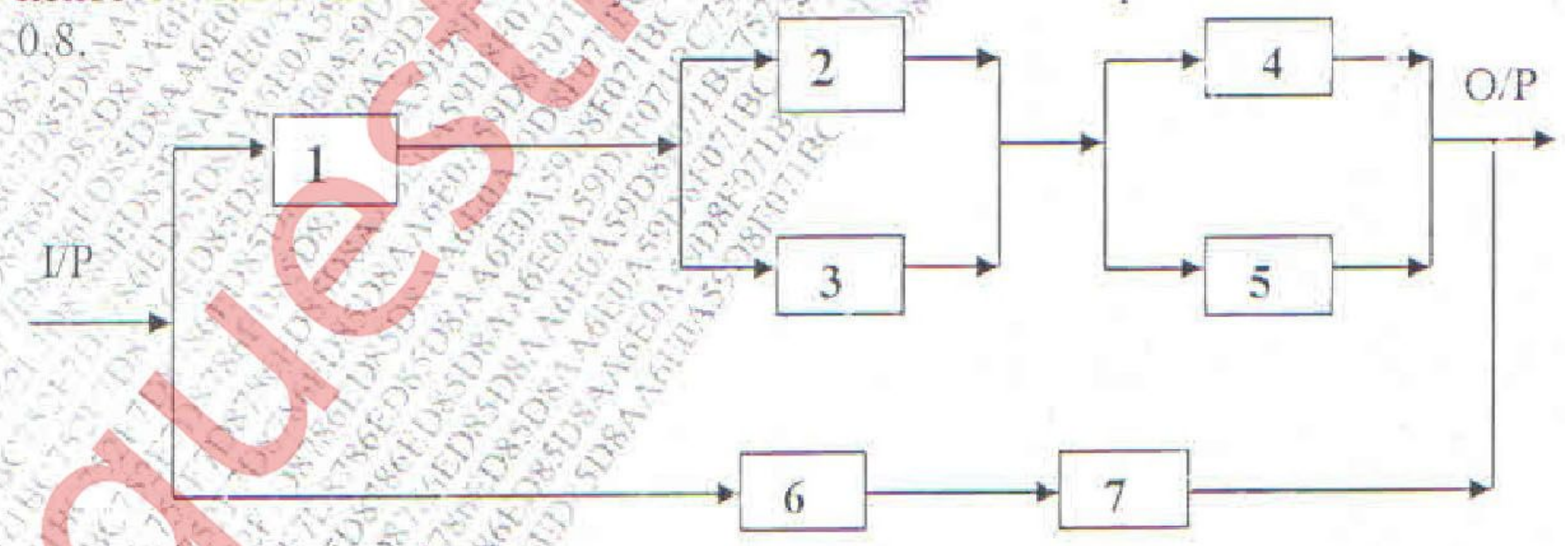

Figure for Q.4b

Please Turn Over

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5. a) Describe the various data requirements for composite system reliability evaluation. 10
   b) Explain frequency and duration method and hence explain the concept of rate of departure. 10

6. a) A generating system contains four 25 MW generating units each with FOR = 3% and one unit of 30MW unit with FOR=5%. Prepare capacity outage table. 10
   b) Explain two state Markov model and derive the expression of availability and unavailability. Draw the state space model for three units indicating all transition rates. 10