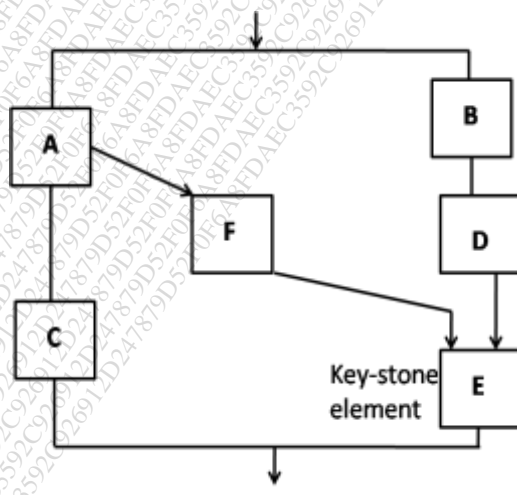


(Time: 3 Hours)

Total Marks – 80

- N.B.:-** (1) Question No.1 is compulsory.  
 (2) **Attempt** any **three** questions out of remaining **five** questions.  
 (3) Assume necessary data wherever necessary.

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|--------|--|-----------|
| Q 1.   | Answer any four of the following questions.  | <b>20</b> |
| a)     | What do you mean by weather load model?  | <b>5</b>  |
| b)     | Write short note on DC load flow.  | <b>5</b>  |
| c)     | What do you mean by bath tub curve in reliability studies?   | <b>5</b>  |
| d)     | Obtain COPT of a generating system consisting of:<br>3*10MW units with FOR of 0.01<br>1*20MW unit with FOR of 0.01   | <b>5</b>  |
| e)     | Draw the Markov model used for rapid start units in operating reserve studies.   | <b>5</b>  |
| Q 2 a) | Explain various classifications of power system loads.   | <b>10</b> |
| Q 2 b) | What do you mean by load forecasting?  | <b>10</b> |
| Q 3 a) | Explain reactive power planning of power system.   | <b>10</b> |
| Q 3 b) | Explain strategic planning of powers system.   | <b>10</b> |
| Q 4 a) | Derive the general expression for reliability in terms of hazard rate.   | <b>10</b> |
| Q 4 b) | Evaluate reliability of the given system using conditional probability method.<br>Each component has a reliability of 0.99. Take E as the key-stone element. | <b>10</b> |



- Q 5 a) A generating system consists of the following units: **10**  
1\*10MW units with FOR of 0.08  
1\*20MW units with FOR of 0.08  
1\*30MW units with FOR of 0.08  
1\*40MW units with FOR of 0.08

Calculate LOLE for this system for a single daily peak load of 60MW.

- Q 5 b) A generating system contains 3\*25MW units each with a 4% FOR and 1\*30MW unit with a 5% FOR. If the peak load for a 100 day period is 75MW, what is the LOEE for this period? Assume that the appropriate load characteristic is a straight line from the 100% to the 80% points. **10**
- Q 6 a) What are the various data required for reliability evaluation of composite generation and transmission systems? **10**
- Q 6 b) Write short notes on: **10**

- Area risk curve                      ii)    Outage replacement rate

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