(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.

Q 1.	Answer the following questions.	**20**
a)	What are different methods of Load Forecasting	**5**
b)	What is Bathtub Curve? State its significance?	**5**
c)	Explain Lead Time in PJM Method.	**5**
d)	A power system has 100 identical units. Each unit has FOR of 0.05. What is the probability of finding 2 units out of service at any time?	**5**
Q 2 a)	Explain Long Term, Short Term and Medium Term Planning	**10**
Q 2 b)	Describe the role played by Load Forecaster.	**10**
Q 3 a)	Explain the duties of power system engineer in short term, long term and medium-term planning.	**10**
Q 3 b)	Consider a system containing five 40 MW unit each with a forced outage rate of 0.02. With install capacity 200MW. Consider load duration curve with peak load is 165 MW and base load is 40% of peak load. Evaluate loss of load expectation (LOLE)	**10**
Q 4 a)	Explain two state Markov Model and derive an expression for Availability and Unavailability. Draw state model for three units indicating all transition rates.	**10**
Q 4 b)	Explain frequency and duration method and compare it with LOLP (Loss of load probability)	**10**
Q 5 a)	Explain Individual Load Point Indices and System Load Point Indices.	**10**
Q 5 b)	What are Data Requirements for Composite System Reliability Evaluation?	**10**
Q 6	Write Short Note on (any two)	**20**
a)	Markov Process	
b)	MTTF and Failure rate	
c)	Modified PJM Method	
