Duration: 3 hrs **Total Marks: 100**

NOTE:

1. Question No 1 is compulsory
2. Solve any four out of remaining six questions
3. Figures on right hand indicate full marks
4. Assume suitable data if necessary

Q1) Solve **any four** **[20]**

a. Define reliability in power system.
b. Explain difference between loss of load and capacity outage
c. State importance of load forecasting.
d. Define Customer average interruption frequency index **(CAIFI)** and discuss how it differ from System average interruption frequency index **(SAIFI)**.
e. What is Conditional probability approach?

Q2) **[20]**

a. Explain different factor to be considered in distribution system planning.

b. What is load growth characteristic? Describe load growth characteristic for various loads.

Q3) **[20]**

a. A generation system has 4 identical units of 50 MW each with FOR=0.02. The load duration curve is linear with load factor of 60% and peak load 150MW.determine for this system loss of load probability and risk factor.

b. Define the series and parallel system availability R (t) and unavailability Q (t) if n numbers of components are connected in series and parallel respectively.

Q4) **[20]**

a. A generator system consist of two units of 25MW and one unit of 50 MW with failure rate 0.01 failure/year and repair rate 0.49 repair /year. Find the generator model probability, departure rate and state frequency.

b. Define two states Markova model and the expression for availability and unavailability.

Q5) **[20]**

a. Explain customer-oriented indices and load and energy–oriented indices.

b. Explain data requirement for system reliability evaluation.

Q6. **[20]**

a. The system shown in following table has availability and unavailability of 0.98 and 0.02 respectively

Unit no.	Capacity(MW)	Failure rate(f/day)	Repair rate(r/day)
1	25	0.01	0.49
2	25	0.01	0.49
3	50	0.01	0.49

Find system cumulative probability by recursive algorithm

b. Explain the impact of renewable energy on reliability of power system

---