



Name :
Roll No. :
Invigilator's Signature :

CS/M.Tech (EE)/SEM-1/MPS-103/2012-13

2012

POWER SYSTEM PLANNING & RELIABILITY

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

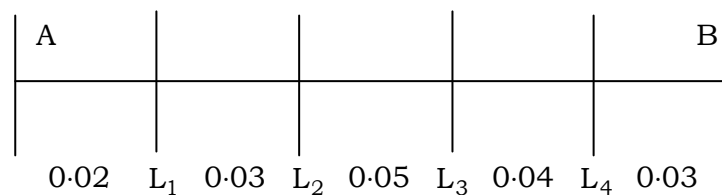
*Candidates are required to give their answers in their own words
as far as practicable.*

Answer question No. 1 and any *four* from the rest.

1. Explain the following : 4 × 3.5
 - a) Loss of Load Probability.
 - b) Difference between incremental cost and average cost.
 - c) Long Term load forecasting.
 - d) Probability of composite system.
2. Write short notes on the following : 2 × 7
 - a) Forecasting process of Daily Load Curve.
 - b) Preparation of Capacity Outage Probability Table of a power plant.
3.
 - a) Explain the difference between Unit Commitment and Economic load scheduling process.
 - b) How is a daily load curve prepared and how does it help the daily system operational planning ? 2 × 7

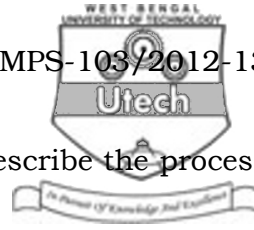


4. a) What is loss of load probability ? How is it related to daily load duration curve ? 6
- b) A steam power plant of 1000 MW capacity is to be set up. The choice is between two 500 MW and four 250 MW sets. If the forced outage rates (FOR) of the generators are 0.025, what is the probability of at least 500 MW will be available ? 8
5. a) Describe with suitable diagram the Mesh and loop type of distribution network. 4
- b) The distribution network shown in Figure below has four line sections connected in series. Each of the line sections has FOR as shown on the lines. At the end of each line sections a load is connected as shown in the diagram.



What is the total probability of loss of load L_2 , if the system is

- i) supplied from and A only ?
- ii) supplied from ends A and B ? 10
6. The load duration curve of a city has a maximum demand of 800 MW over 8 hours, 600 MW over 16 hours and 400 MW over 24 hours. This load is supplied from a power station with installed capacity of 1000 MW with 4 units of 250 MW each. If the forced outage rate (FOR) of each of the generators is 0.04, calculate the total probability of 600 MW of load not supplied in a year. 14



7. a) With the help of a Two-state model describe the process of calculating Forced Outage Rate.
- b) Derive from fundamental principles the method of least square error curve fitting for forecasting. 2×7
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