

**B.Tech. - VIEP - ELECTRICAL ENGINEERING
(BTELVI)**

Term-End Examination

December, 2018

00163

BIEEE-010 : POWER SYSTEM RELIABILITY

Time : 3 hours

Maximum Marks : 70

*Note : Attempt any **five** questions. All questions carry equal marks.*

1. (a) Define Generating unit unavailability. 4
(b) Define Capacity outage probability table.
Explain it in detail. 10
2. (a) Discuss the concept of Probability Array
Method in two interconnected systems. 4
(b) A feeder is composed of overhead section
and an underground section. Find the
failure rate and restoration time for the
feeder given the following component rates :
Overhead feeder : 0.1 fault/cct-mi-yr.
Underground feeder : 0.1 fault/cct-mi-yr.
Cable termination : 0.002 fault/termination-yr. 5
(c) Write comparison between Variable
Reserve and Maximum Peak Load Reserve. 5

3. (a) Explain the PJM method. 4
- (b) Define Outage Replacement Rate (ORR). 5
- (c) Discuss the security function model. 5
4. (a) Discuss the reliability indices for interconnected power systems. 10
- (b) Define Parallel and Mesh network with one example. 4
5. (a) Draw bathtub curve for hot reserve and indicate regions. 4
- (b) Two 75 MW hydrogenerators have identical forced outage characteristics :
- $\lambda_f = 0.00488/\text{days}$, $r_f = 1.066$ days.
- What is the duration and frequency of occurrence of overlapping forced outages ? 10
6. (a) Define the “customer oriented indices” and “load and energy oriented indices” for a distribution system. 10
- (b) Discuss the applications for radial systems in the distribution network. 4
7. (a) Discuss the effect of load transfer in the system of distribution network. 7
- (b) Discuss the effect of spinning reserve in power systems. 7