[Total No. of Questions - 9] [Total No. of Printed Pages - 3]

May-24-0445

EE-503 (Electrical Power Generation)

B.Tech. 5th (CBCS)

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five in all, selecting atleast one question each from section ABCD. Section-E is compulsory. Each section carries equal marks.

SECTION - A

1. Give a general layout of a hydroelectric power plant. Explain the functions of different components in storage reservoir plants. (10)

2. (a) Discuss the factors to be taken in to account while selecting the site for a thermal power station. (5)

   (b) Name and explain the main components of nuclear power plant. (5)

SECTION - B

3. (a) A power station has a following daily load cycle:

Time (in hours)	6-8	8-12	12-16	16-20	20-24	24-6
Load (in MW)	20	40	60	20	50	20

   Plot the load curve and load duration curve. Also calculate the energy generated per day. (6)

   (b) How are electrical loads classified in distribution system? (4)

4. (a) State what is meant by base load and peak load stations. Discuss the combined operation of the run-off river plant and a steam plant in combined operation of both the plants. (5)

   (b) What is standby power station? How are these important? How can standby capacity be determined? (5)

SECTION - C

5. Why is it necessary to consider transmission loss in optimum scheduling? How can the effect of these losses included in optimum scheduling of power plants? (10)

6. (a) Describe the reliability consideration in an optimal unit commitment problem. (5)

   (b) Explain hydro-thermal co-ordination and its importance. (5)

SECTION - D

7. Develop the condition of economic operation of a power system with transmission line loss not being considered. Show an algorithm for computer solution of the problem. (10)

8. (a) What is economic dispatch? Develop the modified economic operation criterion for economic dispatch. (6)

   (b) Explain, what is meant by:

   (i) Penalty Factor

   (ii) Incremental Transmission Loss (4)

SECTION - E (Compulsory)

9. (a) What are the types of prime mover?

   (b) What is the function of condenser in a thermal power plant?

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(c) State the importance of load factor.

(d) Name three different types of fuels used in nuclear reactors.

(e) What is unit commitment problem?

(f) What are the assumptions considered in deriving the transmission loss expression?

(g) What techniques are used for getting the solution to the unit commitment problem?

(h) Why is the optimal scheduling problem in the case of thermal plants referred to as a static optimization problem?

(i) What is short term hydro-thermal co-ordination?

(j) When will the penalty function method be adopted in solving optimal power-flow problem? (10×2=20)