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

Dec-24-0379 (CBCS)

EE-503 (Electrical Power Generation)

B.Tech. 5th

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

SECTION - A

1. (a) Explain the criterion for hydro power plant site selection. (5)

   (b) Give schematic diagram of nuclear reactor and mention the cooling mechanism. (5)

2. Draw the schematic diagram of thermal power station and explain its operation with its important components. (10)

SECTION - B

3. A power station has a daily load cycle as under:

   260 MW for 6 hours; 200 MW for 8 hours; 160 MW for 4 hours; 100 MW for 6 hours. If the power station is equipped with 4 sets of 75 MW each, calculate

   (a) Daily load factor

   (b) Plant capacity factor

   (c) Daily requirement if the calorific value of oil used were 10,000 kCal/kg and average heat rate of station were 2860 kCal/kWh. (10)

4. (a) A generating station has the following daily load cycle:

Time (Hours)	0-6	6-10	10-12	12-16	16-20	20-24
Load (MW)	40	50	60	50	70	40

Draw the load curve and find

(i) Maximum Demand

(ii) Units generated per day

(iii) Average Load

(iv) Load factor (7)

(b) What do you understand by base load and peak load of a power station? (3)

SECTION - C

5. (a) How is the sequence of adding units in a thermal plant decided? (5)

(b) Discuss optimal power flow problems without inequality constraints. (5)

6. (a) What are the advantages of hydro-thermal plants combination? (4)

(b) Develop an algorithm for the solution of long-term hydro-thermal scheduling problem. (6)

SECTION - D

7. Describe the need of economic dispatch. Describe how incremental production cost of thermal power station can be determined? (10)

8. (a) Derive transmission loss formula and state the assumptions made in it. (7)

(b) What are the constraints in economic operation of a thermal power system? (3)

SECTION - E (Compulsory)

9. (a) List drawbacks of thermal power plant.

(b) How is a prime mover selected?

(c) What is the importance of diversity factor?

(d) How do stability considerations affect the plant capacity to be operated?

(e) What do you understand by a standby power station?

(f) Define utilization factor.

(g) What do you mean by commitment of a unit?

(h) What are the points that should be kept in mind for the solution of economic load dispatch problems when transmission losses are included and co-ordinated?

(i) Why must the spinning reserve be maintained?

(j) What is an optimal power flow problem? (10×2=20)