



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-II Summer 2025	
Exam Seat No.:	
Academic Year: 2024-2025	Semester: IV
Class: SY	Program: B.Tech
Branch Code: ELE	Pattern: 2023
Name of Course: Power System Engineering	Course Code: 2306213
Max. Marks: 30	Duration: 1.15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

- 1 a) Define and Explain the following terms (any 3) (7) CO1
- i) Maximum demand ii) Diversity factor iii) Demand factor iv) Base Load v) Peak load of power station

Question No. 2

- 2 a) An electric supply company having a maximum load of 80 MW generates 15×10^7 units per annum and the supply consumers have an aggregate demand of 100 MW. The annual expenses including capital charges are : (8) CO5

For fuel = Rs 70 lakhs

Fixed charges concerning generation = Rs 25 lakhs

Fixed charges concerning transmission and distribution = Rs 30 lakhs

Assuming 80% of the fuel cost is essential to running charges and the loss in transmission and distribution as 18% of kWh generated, deduce a two part tariff to find the actual cost of supply to the consumers.

OR

- 2 b) The daily demands of three consumers are given below : (8) CO5

Time	Consumer 1	Consumer 2	Consumer 3
12 midnight to 8 A.M.	No load	1100 W	No load
8 A.M. to 2 P.M.	500 W	No load	100 W

2 P.M. to 4 P.M.	100 W	900 W	1100 W
4 P.M. to 10 P.M.	700 W	No load	No load
10 P.M. to midnight	No load	100 W	100 W

Plot the load curve and find (i) maximum demand of individual consumer (ii) load factor of individual consumer (iii) diversity factor and (iv) load factor of the station.

Question No. 3

3 a) Explain any one of the following

(7) CO2

1. Economic load dispatch with example.
2. Unit commitment and its constraints

Question No. 4

4 a) A generator is supplying power to a load. To meet an incremental increase of 5.5 MW in load, the generation must be raised by 8 MW. Given that the incremental cost at the plant bus is Rs.250/MWh, what would be the incremental cost at the receiving end?

(8) CO5

OR

4 b) Construct the priority list for following three units;

(8) CO5

$$\begin{aligned}
 F_1 &= 460 + 7P_1 + 0.0015P_1^2 \quad 100MW \leq P_1 \leq 500MW \\
 F_2 &= 400 + 5P_2 + 0.001P_2^2 \quad 50MW \leq P_2 \leq 500MW \\
 F_3 &= 560 + 6P_3 + 0.002P_3^2 \quad 50MW \leq P_3 \leq 400MW
 \end{aligned}$$

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