



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

	InSem Examination-IISummer2024		
	Exam Seat No.:		
	Academic Year:2023-2024	Semester: IV	
	Name of Programme: SY B.Tech -Electrical Engg	Pattern: 2022	
	Name of Course: Power System Engineering	Course Code:ELE222014	
	Max. Marks:30	Duration: 1hr	

	<p>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.</p> <ol style="list-style-type: none">1. This question paper contains _____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.	
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Question No. 1 Attempt following Question

- a) List out various types of tariffs and explain any three of them. (7) CO1

OR

- b) Draw typical nature of daily load curve. What information you will get from the load curve (7) CO1

- c) What are the causes of low power factor? Discuss impact of power factor on tariff. (8) CO2

OR

- d) Explain the problem statement of economical load dispatch without losses and Equality constraints and inequality constraints (8) CO2

Question No. 2 Attempt following Question

- a) A power station has a maximum demand of 15000kW. The annual load factor is 50% and plant capacity factor is 40%. Determine the reserve capacity of the plant. (7) CO5

OR

- b) A factory has a maximum load of 240kW at 0.8 p.f. lagging with an annual consumption of 50,000 units. The tariff is Rs. 50 per kVA of maximum demand plus 10 paise per unit. Calculate the flat rate of energy consumption (7) CO5

- c) Two plants are scheduled to supply a load of 500MW. The cost of each plant is as follows: (8) CO5

$$C_{g1} = 0.008P_{g1}^2 + 7P_{g1} + 300 \cdot \text{Rs/hr}$$

$$C_{g2} = 0.008P_{g2}^2 + 6P_{g2} + 350 \cdot \text{Rs/hr}$$

1. If load shared by two alternators is equal find (a) Incremental cost (b) Total cost required to fulfil the load demand
2. For economic operation find (a) Load shared by each plant (b) Incremental cost (c) Total cost required to fulfil the load demand.
3. What will be the saving if economic load sharing is preferred.

OR

- d) Construct the priority list for three units whose data are given below (8) CO5

$$\begin{array}{ll} F_1 = 560 + 8P_1 + 0.0015P_1^2 & 100MW \leq P_1 \leq 600MW \\ F_2 = 500 + 6P_2 + 0.001P_2^2 & 50MW \leq P_2 \leq 500MW \\ F_3 = 460 + 7P_3 + 0.002P_3^2 & 50MW \leq P_3 \leq 400MW \end{array}$$

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