Reg. No.

**Question Paper Code** 

11477

17 DEC 2022

# B.E./B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022

Seventh Semester

### **Mechanical Engineering** ME8792 - POWER PLANT ENGINEERING

(Regulations 2017)

Duration: 3 Hours

Max. Marks: 100

## PART - A $(10 \times 2 = 20 \text{ Marks})$

Answer ALL Questions

1. 2. 3. 4. 5. 6. 7. 8. 9.	Classify draught systems commonly available in thermal power plants.  What is dead storage and live storage?  What are the methods of cooling in a diesel engine power plant?  Name the different components of nuclear power plant.  Why liquid metal preferred in fast breeder reactor.  Give the significance of solar thermal energy conversion.  What is the solar photovoltaic cell and module?  How will you describe two-part tariff?  What is meant by high level nuclear waste?  What is meant by low level nuclear waste?	Marks, K-Level,CO 2,K2,CO1 2,K1,CO2 2,K1,CO3 2,K2,CO3 2,K2,CO4 2,K1,CO4 2,K1,CO5 2,K1,CO6
	$PART - B (5 \times 13 = 65 \text{ marks})$	2,K1,CO6

### $PART - B (5 \times 13 = 65 \text{ marks})$ Answer ALL Questions

11. a) Explain the following systems with neat sketches:

13, K1,CO1

- (i) Mechanical ash handling system.
- (ii) Hydraulic ash handling system.

### OR

- What do you understand by the cogeneration of power and process 13, K2,C01 heat? Explain about the cogeneration plant with neat sketches.
- 12. a) Discuss in detail about the thermodynamic processes involved in Otto, 13,K3,C02 and Diesel cycles with p-V and T-s diagrams and compare the cycle efficiencies.

- (i) Explain the necessity of a cooling system in a diesel engine power 6,K2,C02 b)
  - (ii) Elaborate different methods of cooling of a Diesel engine power 7,K2,CO2

K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 - Create

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13. a) Explain the main features of CANDU reactor and elaborate the 13,K2,C0 arrangement of calandria in a CANDU reactor with a neat sketch.

#### OR

- b) Draw the Layout diagram of Hydro Power Plant and also explain the 13,K2,C0 components and working of Hydro power plant?
  - 14. a) What is the principle of tidal energy? State its advantages and 13,K2,CO<sub>3</sub> disadvantages. Describe a two-pool tidal plant

#### OR

- b) Explain in detail how power is produced in a Solar Photo Voltaic 13,K2,CO4 power plant and List out the advantages and disadvantages.
- 15. a) (i) Explain the terms peak load, demand factor, load factor and plant 6,K2,C05 use factor.
  - (ii) What are load curves and load duration curves? Discuss their utility 7,K2,C in the economics of generation.

#### OR

b) Discuss various pollution control techniques used in coal based 13,K2,C06 thermal Power Plants.

### PART C $(1 \times 15 = 15)$

16. a) The maximum demand of a power station is 80,000 kW and daily load is described as follows

Time (hrs)	0-6	6-8	8-12	12-14	14-18	18-22	22-24
Load (MW)	40	50	60	50	70	80	40

- (i) Determine the load factor of power station and draw load duration 7,K2,C05
- (ii) What is the load factor of standby equipment rated at 25 MW that 8,K2,Coo takes up all loads in excess of 60 MW?

#### OR

b) You have been as appointed as Advisor to Government of India, in the 15,K3,C06 year 2050. What type of power plant will you suggest to GOI? Limit your answer to 250 to 300 words.