

22327

21819

3 Hours / 70 Marks

Seat No.

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- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) Define fission and fusion related to nuclear fuel.
 - b) Classify hydropower plant on the basis of water head and state turbine used for them.
 - c) State any two advantages of Kaplan turbine over Francis turbine.
 - d) List different types of concentrating type solar collectors.
 - e) State the various types of Biomass Resources.
 - f) State range of wind speed is considered favorable for wind power generation.
 - g) Define the term “cold reserve” and “hot reserve”.

P.T.O.

- 2. Attempt any THREE of the following: 12**
- a) Describe Nuclear Hazards and various ways of disposal of nuclear waste.
 - b) Draw schematic arrangement of hydro electric power station and describe energy conversion process of hydro power plant.
 - c) Describe main features of various types of generators and their suitability w.r.t wind power generation.
 - d) State the causes and impacts of state grid system fault.
- 3. Attempt any THREE of the following: 12**
- a) Compare fire tube and water tube boilers used in thermal power plants.
 - b) Describe safe practices for hydro power plants.
 - c) Describe with layout the working of solar Photo Voltaic (PV) power plant.
 - d) State the various problems caused during operation of large wind power generators.
- 4. Attempt any THREE of the following: 12**
- a) Draw schematic arrangement of diesel engine power station and important systems and essential components of diesel plant
 - b) Explain layout of thermo-chemical based (Municipal waste) power plant.
 - c) Compare Horizontal axis and vertical axis wind machine on the basis of
 - (i) Power captured for the same tower height.
 - (ii) Noise problem.
 - (iii) Complexity of design and yaw mechanism
 - (iv) Effect of fatigue arising from numerous resonance in structure.

- d) Define the terms:
- (i) Load factor
 - (ii) Diversity factor
 - (iii) Demand factor
 - (iv) Plant capacity factor.
- e) Explain how load curves helps in the selection of size and number of generating units.

5. Attempt any TWO of the following: 12

- a) Explain with layout the working of typical thermal power plant with steam turbines and electric generators.
- b) Explain with neat sketch the construction and working of pelton turbine used in hydro power plant.
- c) Explain with neat sketch, layout of Bio-chemical based (biogas) power plant.

6. Attempt any TWO of the following: 12

- a) Draw the layout of typical micro hydro scheme and describe potential locations of micro-hydro power plants in Maharashtra.
- b) Explain with layout, the working of parabolic trough collector concentrated solar power plants.
- c) A load on a power plant on a typical day is as under:-

Time	12-5 AM	5-9 AM	9-6 PM	6-10 PM	10PM-12AM
Load in MW	20	40	80	100	20

Plot the chronological load curve and load duration curve. Find the load factor of the plant and energy supplied by the plant in 24 hours.
