22327

12425

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following : **10**

(a) State the name of boiler preferred for high capacity Thermal Power Plant.

(b) Classify the hydro-electric plants according to the head (any two points).

(c) List any two large hydro power plants in Maharashtra with their capacity.

(d) List different types of concentrating type solar collectors.

(e) State any two advantages of solar energy.

(f) State the types of Wind Power Plant according to construction.

(g) Define the following terms :

(i) Cold reserve

(ii) Spinning reserve

2. Attempt any THREE of the following : **12**

(a) Illustrate the purpose of shielding and reflector in a nuclear reactor.

(b) State any four factors for selection of hydro power plant.

(c) With a neat diagram, explain Doubly Fed Induction Generator (DFIG).

(d) State the impact and reasons of Grid system fault.

3. Attempt any THREE of the following : **12**

(a) Draw a block diagram of thermal power plant and label the (i) Boiler (ii) Condenser (iii) Superheater (iv) Turbine.

(b) State the functions of the following parts of hydroelectric power station :

(i) Reservoir

(ii) Tailrace

(iii) Spillway

(iv) Surgetank

(c) Draw the basic Photo Voltaic (PV) system for power generation and state the function of each block.

(d) 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) Axis of orientation

4. Attempt any THREE of the following : **12**

(a) Draw a complete layout of diesel electric power plant showing

(i) Engine starting system

(ii) Engine exhaust system

(iii) Engine cooling system

(iv) Engine lubrication system

(b) State an importance of solar power in the energy deficient India.

(c) Draw a neat layout of geared wind power plant (HAWT) and label it.

(d) Differentiate between Base load & Peak load plants.

(e) A plant having load factor of 0.8 has maximum demand of 150 MW. Calculate energy generated by this plant in one month of 30 days.

5. Attempt any TWO of the following : **12**

(a) State the types of radioactive wastes generated in a nuclear power station. Explain the methods employed for their disposal.

(b) Draw schematic arrangement of hydroelectric power station and describe energy conversion process of hydro power plant.

(c) Illustrate with neat diagram the thermo-chemical based (Municipal waste) power plant and their any two advantages.

6. Attempt any TWO of the following : **12**

(a) Illustrate with neat sketch the Pelton Turbine used in hydro power plant and for which type of plant it can be preferred according to head ?

(b) State the various types of Biomass Resources. Draw a layout of Bio-chemical based (biogas) power plant.

(c) A generating power station has the following daily load cycle :

Time (hours)	0 – 6	6 – 10	10 – 12	12 – 16	16 – 20	20 – 24
Load (M.W.)	15	20	10	15	30	25

Draw the load curve and find :

(i) Maximum demand

(ii) Units generated per day

(iii) Average load

(iv) Load factor