17324

21314

3 Hours / 100 Marks Seat No. | | | | | | | | |

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.

Marks

1. Attempt any <u>TEN</u> of the following: **20**

a) What is conventional source of Energy. State two examples for the same.

b) State any two advantages of thermal power station.

c) Name any two thermal power stations in Maharashtra with their capacity.

d) What is forebay ? What is its function ?

e) Write down the capacity in MW and efficiency on full load of Hydrogenerators.

f) List out any two nuclear power stations in India with capacity.

g) What is nuclear chain reaction ?

h) Explain captive power generation in brief.

i) Compare base load plant with peak load plant on any two points.

Marks

j) Define the following terms as referred to a power station:

i) Maximum demand

ii) Load factor

k) Write down any two disadvantages of nuclear power station.

l) Explain Air-intake system of diesel power station in brief.

2. Attempt any <u>FOUR</u> of the following: **16**

a) What is calorific value ? Write down calorific value of Bituminous coal and petrol. Also give any two advantages of liquid fuels over solid fuels.

b) What are the points to be considered while selecting site for a steam (thermal) power station ? Explain any four points in detail.

c) i) Name four different ash handling systems.

ii) Classify dust collectors. What happens to their efficiency when load increases ?

d) Classify hydro-electric power plants according to head and explain each type in brief.

e) What is

i) fire tube boiler

ii) water tube boiler. Also write their maximum pressure, capacity and one example for each type.

f) State the function of following components of a thermal power station:

i) Economiser

ii) Air-preheater

iii) Alternator

iv) Condenser.

Marks

3. Attempt any FOUR of the following: **16**

a) State any four advantages and any two disadvantages of Hydro-electric power station.

b) How will you dispose nuclear waste ? Explain the method for solid, liquid and gaseous waste.

c) Describe the working of four stroke diesel engine.

d) Draw a neat labelled block diagram of thermal power station.

e) Give the schematic arrangement of Hydro-electric power plant. Also write the function of dam and surge tank.

f) With a neat diagram, explain the main features of advanced gas cooled reactor.

4. Attempt any FOUR of the following: **16**

a) What factors have to be kept in view while selecting site for hydro-electric plants.

b) Explain any six applications of diesel power plants.

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

d) What is a cooling tower ? Where is it used ? Explain its working in detail.

e) Describe the following systems of a diesel electric plant:

i) Engine starting system

ii) Engine exhaust system.

f) State the function of Natural, Mechanical, Forced and Induced draught systems.

Marks

5. Attempt any <u>FOUR</u> of the following: **16**

a) Draw the schematic arrangement of a typical Nuclear power plant and state the function of reflector.

b) What is Solar Collector ? Give any three advantages of concentrating collector over flat type collector.

c) What are the reasons for variation in solar radiation reaching the earth and that received at the outside of the atmosphere ?

d) How are nuclear reactors controlled ? Explain two different methods in brief.

e) Explain the following terms as referred to a Hydro-electric power plant:

i) Surface run-off

ii) Precipitation

iii) Evaporation

iv) Water hammer.

f) State the function of following components of a nuclear power station:

i) moderator

ii) shielding

iii) control rod

iv) coolant

Marks

6. Attempt any <u>FOUR</u> of the following: **16**

a) Give any four limitations of wind energy.

b) Draw the block diagram for wind energy conversion system and mark all the components.

c) What is interconnected system ? Write any three advantages of this system ?

d) What is radioactive Isotope ? Give one example. Also explain mass defect and binding energy in brief.

e) A generating station has the following daily load cycle:

Time (Hours)	0-6	6-10	10-12	12-16	16-20	20-24
Load (MW)	40	50	60	50	70	40

Draw the load curve and find:

i) maximum demand

ii) units generated per day.

iii) average load

iv) load factor.

f) Draw the basic photo voltaic system for power generation and state the function of each block.

17324

21314
3 Hours / 100 Marks