17324

14115

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.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

Marks

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

a) State the different types of fuels with two example of each.

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

c) State the different types of condensers used in thermal power station.

d) Define penstock in Hydroelectric Plant.

e) Give the types of hydro power plant on the basis of availability of water head.

f) State the purpose of reflector in a nuclear power plant.

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Marks

g) Give four properties of a good moderator for nuclear reaction control.

h) List the main parts of a diesel electric power plant.

i) Define cold reserves and hot reserves of a power system.

j) Define the load factor of a powerplant.

k) State location of any four nuclear plants in India.

l) Give four applications of diesel power plant.

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

a) Compare conventional energy sources with non-conventional energy sources. (any four)

b) Write the purpose of coal and ash handling unit also write different activities that are carried out in this unit.

c) Draw a neat layout of thermal power station and label it.

d) Explain working of the pumped storage plants.

e) Explain why the overall efficiency of thermal power station is low. Suggest any four remedies improvement.

f) State any six factors governing selection of site for thermal stations and explain each in brief.

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

a) State the type of power plant preferred for peak load supply of power. Justify the selection.

b) Explain the nuclear chain reaction in a nuclear power plant.

c) Explain the working of two stroke diesel engine with the help of neat diagram.

d) Draw and explain the working of cooling tower in a thermal power station.

e) "Hydro electric power stations are not perennial power station" Justify the statement.

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

Marks

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

a) Explain the purpose of surge of tank and spillway in hydro electric power station.

b) State any four advantages and any four disadvantages of diesel electric power plant.

c) The peak load on a power plant is 40 MW. The loads having maximum demands of 30 MW, 5 MW and 8 MW are connected to the power station. The annual load factor is 50% find.

(i) Average load on power station.

(ii) Demand factor

(iii) Diversity factor

(iv) Load factor

d) Discuss the special features of a turbo-alternator used in a thermal power station.

e) Describe the fuel system and exhaust system of a diesel power station.

f) 'Running and maintenance costs of thermal power station are more than hydro power stations. Justify the statement.

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

a) Explain the role of control rod in a nuclear reactor. State any two materials for control rod.

b) Explain working of solar cell in solar power generation.

c) Draw wind power plant diagram and show main components of wind power plant.

d) Explain the working of nuclear power plant with the help of neat sketch.

e) Explain the purpose of shielding and reflector in a nuclear reactor.

f) Surge tank is compulsory in the case of high head hydropower plant. Give the reason.

Marks

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

a) State any four advantages and any four limitations of wind energy.

b) Explain how load sharing is achieved between power stations in inter connected systems.

c) Explain importance of solar power in the energy defficient India.

d) Explain why nuclear power plants are preferred as base load plants.

e) The maximum demand of a power plant is 100 MW. The capacity factor is 0.6 and utilisation factor is 0.81. Find.

(i) Load factor

(ii) Plant capacity

(iii) Reserve capacity

(iv) Annual energy production

f) Draw the functional block diagram of photo volatic power generating system and explain each block in brief.
