B. Tech.
(SEM. IV) EXAMINATION, 2006-07
POWER PLANT ENGINEERING

Time : 3 Hours] [Total Marks : 100

Note : (1) Attempt all questions.
(2) All questions carry equal marks.

1 Attempt any four parts of the following: 5×4=20

(a) Explain what you understand by base load and peaking load? Why are base load plants loaded heavily?

(b) What are the considerations to be made while selecting the suitable site for a thermal and a nuclear power plant?

(c) What do you understand by externally irreversible and internally irreversible Rankine cycle?

(d) What are the industrial wastes and by products used as boiler fuels?

(e) What is the function of a steam generator? Enlist its basic components.

(f) What is the forced outage rate?

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2 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) (i) Enumerate the means by which the coal from coal mines can be transported.

(ii) What are the limitations of chimney draft?

(b) Write short notes on:

(i) Sub-critical boiler

(ii) Maintenance of steam power plant.

(c) (i) Enumerate various methods of feed water treatment.

(ii) What are the different turbine auxiliary systems? Describe in short.

3 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) (i) What is a fuel injector? Explain a pintle nozzle.

(ii) Explain the important functions of the lubrication system in diesel engine.

(b) (i) Discuss the effect of intercooling and reheating in a gas turbine plant.

(ii) Give the specific advantages and disadvantages of a gas turbine plant for a utility system.

(c) Write short notes on:

(i) Applications of diesel electric power plants.

(ii) Heat balance sheet in diesel engine (minute basis)

(iii) Methods for improvement of thermal efficiency of open cycle gas turbine plant.
Attempt any **two** parts of the following: \( 10 \times 2 = 20 \)

(a) (i) Explain the characteristic features of a PWR.

(ii) Explain the characteristic features of a BWR.

(b) (i) What is a surge tank? Why is it important in a hydro-plant?

(ii) What are the key parameters of water on which the magnitude of hydro-power depends?

(iii) What is a spillway? Why are spillways required?

(c) Write short notes on:

(i) Solar energy based plant

(ii) Hydro-electric plants.

Attempt any **four** parts of the following: \( 5 \times 4 = 20 \)

(a) Give the classification of generating equipment.

(b) What is the necessity of generator cooling? What methods are used for generator cooling?

(c) List the functions which the various types of instruments in a power plant have to perform.

(d) Explain briefly U-tube manometer.

(e) Explain briefly resistance thermometers.

(f) Describe briefly about gaseous pollutants discharged by thermal power plants.