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SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION DECEMBER 2011

ME 04 701—POWER PLANT ENGINEERING

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

Part A

I. (a) What is Reheat Cycle ? Compare Reheat cycle with Regenerative cycle.

(b) Compare Steam power plant with Diesel power plant.

(c) What is over feed stocker ? Compare Over feed stocker with Under feed stocker.

(d) Explain the dust removal system in Babcock and Wilcox boiler.

(e) What is supersaturated flow ? Explain.

(f) What are the classification of turbines ?

(g) Explain the advantages and disadvantages of nuclear power plant.

(h) Define following :

(i) Diversity factor.

(ii) Capacity factor.

(8 × 5 = 40 marks)

Part B

II. (a) (i) What is combined gas power cycle ? Mention its advantages.

(ii) Write short notes on "Deaerator".

Or

(b) Explain the layout of steam power plant and mention its advantages and disadvantages.

III. (a) (i) What are the different types of pressure gauges used in water tube boiler and explain any one ?

(8 marks)

(ii) Explain the working principle of fusible plug.

(7 marks)

Or

(b) (i) Explain about Pulverized coal burners. (10 marks)

(ii) Mention the advantages and disadvantages of fluidized bed combustion.

(5 marks)

IV. (a) An impulse turbine having set of 16 nozzles received steam at 25 bar and 450°C. The pressure of the steam at the exit is 12 bar. If the total discharge is 260 kg/min and nozzle efficiency is 92%, find the area at the exit of each nozzle. If the steam velocity at the entry to the nozzle is 50m/sec, find the percentage increase in discharge.

Or

Turn over

(b) (i) Explain with the help of h-s diagram about the effect of friction in steam nozzle. (8 marks)

(ii) Name different methods for turbine compounding and explain any one. (7 marks)

V. (a) (i) How are cooling towers classified ? Explain any one with neat sketch. (10 marks)

(ii) Explain the estimation of load in a power plant. (5 marks)

Or

(b) A power plant contains the following details :

Maximum demand 20 MW.

Load factor 0.5.

Plant capacity 0.4.

Plant use factor 0.8.

Find the following :

(i) Daily energy produced.

(ii) Maximum energy produced if the plant running all the time.

(iii) Reserve capacity of the plant.

(4 × 15 = 60 marks)