(b) What do you mean by 'Economics of nuclear power plants' ? 10

SECTION – D

8. (a) Discuss with neat diagram the working of a 'Thermionic power generation system'. 10

(b) Discuss the working of geothermal power plants. 10

9. (a) Describe, with neat sketch, the working and features of a Wind power plant. 10

(b) Discuss diversity factor. Describe how power is generated by MHD. 10

Roll No. .....

24479

B. Tech. 7th Semester (ME)

Examination – December, 2016

POWER PLANT ENGINEERING

Paper : ME-407-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt ***five*** questions in total, selecting ***one*** question from each Section. Question No. 1 is ***compulsory.*** Each question carries equal marks.

1. Discuss the following : 5 × 4 = 20

(a) Methods of measurement for rainfall and run-off

(b) Re-powering system

(c) Breeder reactor

(d) MHD power generator

SECTION – A

2. (a) Discuss the various factors for selection of power plants. 10

(b) Calculate the power that can be developed from a hydro-electric power station having the following data. Catchment area = 100 sq. km.; average value of annual rainfall = 120 cm; Run-off = 80%; available head = 300 m; overall efficiency of the power station = 75%. 10

3. (a) How does a modified Rankine cycle differ from a Rankine cycle ? Write also the expression of modified Rankine efficiency. 10

(b) Why is governing of hydraulic turbines necessary ? Explain the governing mechanism of a Kaplan turbine. 10

SECTION – B

4. (a) Draw a line diagram of in plant coal handling system and explain the equipment used at different stages. 10

(b) How would you make an economic analysis of the combined operation of the hydro and steam power plants ? 10

5. (a) Explain the different methods used for supplying pulverized fuel to the combustion chambers of the boilers with their advantages and disadvantages. 10

(b) An annual load duration curve of a system of loads is a straight line with maximum of 12 MW at the beginning and 2 MW at the end of the year. Annual costs of base and peak load stations are given below :

C1 = 8000 + Rs. 75/kW + 3 paise/kWh (base load)

C2 = 6000 + Rs. 55/kW + 4 paise/kWh (peak load)

Determine the following : 10

(i) Duration of time when peak load station will work in order to obtain the minimum annual cost. http://haryanapapers.com

(ii) The lowest overall cost per kW (in paise).

SECTION – C

6. Draw neat diagrams of PWR and BWR type reactor and explain their working principle and give their advantages. Also discuss a moderator in nuclear reactor. 20

7. (a) Determine the load factor at which the cost of supplying a unit of electricity is same in Diesel station as in a steam station if the respective annual fixed and running charges are given below : 10

Diesel : Rs. (40/kW + 0.06/kWh).

Steam : Rs. (160/kW + 0.015/kWh).