(g) What is principle of cogeneration ?

(h) What are advantages of closed cycle gas turbine over open cycle gas turbine ?

(i) Name any *two* advanced emissions control technologies for coal fired power plant.

(j) List down the various processes of Brayton cycle. **2×10=20**

Roll No. ..... **Total Pages : 04**

July-22-00435

B.Tech. EXAMINATION, 2022

Semester VII (CBCS)

POWER PLANT ENGINEERING

ME-703

Time : 3 *Hours* *Maximum Marks* : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Sections A, B, C and D. Q. No. **9** is compulsory.

Section A

1. What do you understand by base load and peak load hydro power plants ? What types of power plants are used for base load and peal load plants and why ? What are the factors considered in selecting a hydro-electric power plant ? **10**

2. What topological features compel to use shaft spill way ? What are its advantages and disadvantages over the other types ? **10**

Section B

3. Why ash and dust handling problem is more difficult then coal handling problems ? With a neat sketch explain the general layout of ash handling system. **10**

4. What are the problems encountered in the design of gas turbine cumbustion chamber/draw a neat sketch of the combustion chamber used in modern open gas turbine plant. What are the desirable requirements of a good combustion system ? **10**

Section C

5. Draw a neat sketch of a boiling water nuclear reactor and explain the functioning of different components. What is advantages and disadvantages ? **10**

6. Estimate the generating cost per unit supplied from a power plant having the following data :

   Plant capacity = 120 MW.

   Capital cost = Rs. 600 × 106

   Annual load factor = 40%

   Annual cost of fuel, taxation, oil and salaries = Rs. 5,00,000

   Interest and depreciation = 12%. **10**

Section D

7. Explain with a neat sketch the operation of MHD power generation. Write its advantages and disadvantages. **10**

8. With the help of neat diagram, explain the various components of wind turbine. Also draw the layout of wind power plant. **10**

(Compulsory Question)

9. (a) Draw the P-V and T-S diagram for Rankine cycle.

   (b) What is fuel cell ? State and advantages.

   (c) Why is hydrazine injected at the suction of the boiler feed pump ?

   (d) Define compounding of steam turbine.

   (e) List down the various process of Brayton cycle.

   (f) Draw the schematic of a flat plat collector.