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Roll No.

Total No. of Pages : 3

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B.Tech. (EE/EEE) (2011 Batch) (Sem.-4th)**POWER PLANT ENGINEERING**

Subject Code : BTEE-406

Paper ID : [A2021]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A**1. Answer briefly :**

- a) What is steam generator?
- b) Describe the function of economizers.
- c) What are the basic radioactive pollutants ?
- d) What are the advantages claimed for relating the steam in high pressure steam plants?
- e) How the hydro-electric power plants are classified ?
- f) What do you understand by breeding?
- g) What do you understand by Reheat-Regenerative Cycle?
- h) What is super heater?
- i) Name different Gas Turbines.
- j) What do you understand by Binding Energy?

SECTION-B

2. A proposed hydro electric station has an average catchment area of 100 sq. km, rainfall for water efficiency of the plant is 75%. If 80% of the total

Calculate :

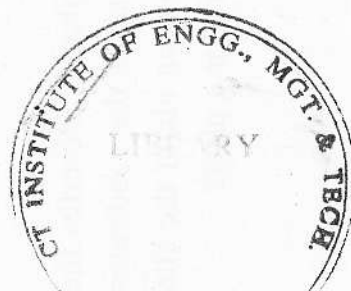
- a) Average power available
 - b) Maximum demand/capacity of the plant, Select Load factor given as 50%.
3. Draw a plant layout for 5 MW diesel power required equipments. Show the arrangement of engine layout.
 4. What do you understand by acid rain or acid controlled ?
 5. In a small capacity of thermal power plant the condenser has a separate air cooling section. The temperature of the condenser is 56°C and temperature at the air inlet is 30°C. The barometer reads 76 cm of Hg.

Find :

- a) The vacuum in the condenser.
 - b) If the discharge of dry air pump is 75 m³/min, find the loss of condensate in kg/hr.
 - c) Loss of condensate due to water vapour ending in the pump.
6. What is the function of the cooling tower in a power plant? Describe the working of a mechanical type of cooling tower.

SECTION-C

7. (a) What do you understand by thermal pollution and its effect of thermal pollution.
(b) Discuss different types of reactors.



8. A continuous combustion constant pressure gas turbine takes in air at 0.95 Kg/cm^2 (93 kN/m^2) with a temperature of 20°C . A rotary air compressor compresses the air to a pressure of 570 kg/cm^2 with an isentropic efficiency of 83%. The compressed air is passed to a combustion chamber in which its temperature is raised to 867°C . From the combustion chamber the high temperature air passes into a gas turbine in which it is expanded to 0.95 kg/cm^2 (93 kN/m^2) with an isentropic efficiency of 80%. For an air flow of 10 kg/s and neglecting the fuel mass as small, determine :
- a) The net power output of the plant if the turbine is coupled to the compressor.
 - b) The thermal efficiency of the plant.
Take $\gamma=1.4$, $C_p = 0.24 \text{ kcal/kg}^\circ\text{K}$.
9. What are the essential elements of a hydroelectric plant ? Describe the different types of dams used for such plants and discuss the conditions under which each type can be used. What information about the site should be made available for deciding the type of dam for a plant?