Code : 102610

B.Tech 6th Semester Exam., 2022

(New Course)

POWER PLANT ENGINEERING

Time : 3 hours   Full Marks : 70

Instructions :

(i) There are **NINE** questions in this paper.

(ii) Attempt **FIVE** questions in all.

(iii) Question No. **1** is compulsory.

(iv) Each question carries **14** marks.

(v) Steam table is permitted.

1. Answer any *seven* of the following questions :

(a) What are the commercial sources of energy?

(b) Why is compounding done for steam turbine?

(c) Where was India's first nuclear power plant installed?

(2)

(d) In fuel cell, which energy is converted into electrical energy?

(e) What is to be used to achieve solar thermal power generation?

(f) Why are thorium breeder reactors most suitable for India?

(g) The overall efficiency of thermal power plant is equal to which cycle?

(h) What is the range of Rankine cycle efficiency of a good steam power plant?

(i) Which efficiency is increased by using binary vapour?

(j) Define work ratio in Rankine cycle.

2. Calculate the thermal efficiency of a simple Rankine cycle for which steam leaves the boiler as saturated vapor at $3 \times 10_6 \ N/m^2$ and is condensed to saturated liquid at 7000 N/m^2. The pump and turbine have isentropic efficiencies of 0·6 and 0·8 respectively. The pump inlet is saturated liquid.

3. Discuss the working principle and application of MHD converter with neat sketch.

4. Classify different types of draught system. Which is the most preferred draught system and why?

5. List the factors which should be considered while designing a power plant.

6. Explain the components of gas turbine and combined cycle power plants.

7. Give the layout of a fast breeder reactor power plant and explain its salient features.

8. Draw line diagram of Brayton cycle, show cycle on p-v diagram and derive expression for efficiency of Brayton cycle.

9. Draw a layout of nuclear power plant and explain different components of it.

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