JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M. Tech I Semester Examinations, February - 2017
THERMAL AND NUCLEAR POWER PLANTS
(Thermal Engineering)

Time: 3hrs   Max.Marks:75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each
question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

1.a) Explain the need of compounding of steam turbines.   [5]
   b) Write the principle of Fluidized bed combustion.   [5]
   c) What is Enrichment process of Uranium?   [5]
   d) Explain diversity factor and demand factor.   [5]
   e) Explain the gas filled thermometers.   [5]

PART - B

5 × 10 Marks = 50

2.a) Explain different coal and ash handling circuits of steam power plants.
   b) Draw the schematic diagram of modern high pressure boiler and explain its working
       principle.   [5+5]

OR

3.a) Draw the line diagram and explain the working details of surface condenser and give its
       Significance and applications.
   b) Compare and contrast in terms of working principle between dry and wet type of cooling
       towers. Draw line diagram and explain the working of hyperbolic cooling tower.   [5+5]

4.a) Draw the schematic diagram of Integrated Gasifier Combined Cycle (IGCC) Power Plant
       with supplementary firing and explain its working.
   b) Differentiate between cogeneration and combined cycle power units with its applications.
                                                                                     [5+5]

OR

5.a) Describe with neat sketches the working of a simple constant pressure open cycle gas
       turbine.
   b) Explain the principle and working concept of combined cycle power plant.   [5+5]

6.a) Describe with the help of a neat sketch the construction working of a pressurized water
       reactor (PWR). What are its advantages and disadvantages?
   b) What is 'Boiling water reactor (BWR)? How does it differ from pressurized water reactor
       (PWR)?   [5+5]

OR

7.a) Explain different types of nuclear reactor mechanisms and give the salient points.
   b) Draw the cross section of Nuclear reactor and explain essential components of it. [5+5]

8.a) Enumerate and explain briefly various methods used to calculate the depreciation cost.
   b) Define the following terms.
      i) Connected load.
      ii) Demand factor.
      iii) Load factor.   [5+5]

OR

9.a) Explain load factor and diversity factor.
   b) For a power plant, yearly duration curve is a straight line from 360 MW to 90 MW. With the help of two generating units of 200 MW each, power is supplied. Calculate the maximum demand, load factor and utilization factor.   [5+5]

10.a) Explain at least one method of measurement of flow and pressure with line diagrams.
    b) What do you understand by Thermal pollution? Explain the bad effects of thermal pollution.   [5+5]

OR

11.a) Explain any one method with the help of line diagram, the flow measurement.
    b) Draw the line diagram and explain the method of flue gas analysis using orasat's apparatus.   [5+5]

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