

Code No: 5121Q

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech II Semester Examinations, February - 2017

THERMAL AND NUCLEAR POWER PLANTS

(Thermal Engineering)

Time: 3 Hours

Max. Marks: 60

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 20 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit.
Each question carries 8 marks and may have a, b, c as sub questions.

PART - A

1. a) List different ash handling systems employed in thermal power station. $5 \times 4 \text{ marks} = 20$ [4]
b) What is meant by combined cycle power plant? [4]
c) What is pressurized water reactor? [4]
d) Define Capacity factor and load factor. [4]
e) Explain different methods used for Pollution control in thermal power stations. [4]

PART - B

- 2.a) With the help of a line diagram, explain the working principle and salient points of velox boiler $5 \times 8 \text{ marks} = 40$
b) What is meant by boiler mountings and accessories and explain them briefly with line diagram. [4+4]

OR

- 3.a) What is meant by compounding of steam turbines and why it is needed. Explain one method of compounding with line diagram
b) With help of a neat diagram, explain the working principle of surface condenser. [4+4]

4. What is meant by fluidized bed combustion? What are the advantages and limitations of the same? [8]

OR

5. Explain the combined cycle with heat recovery boiler with the help of a neat diagram. [8]

- 6.a) Explain the working details of nuclear reactor with salient points.
b) What is meant by enrichment of nuclear fuel? What are the advantages of the same? [4+4]

OR

7. What are the effects of nuclear radiation? Explain briefly. List out different methods used in disposal of nuclear waste. [8]

- 8.a) Write the details of performance characteristics of power plants.
 b) The yearly duration curve of a certain plant is a straight line from 300 MW to 80 MW. Power is supplied with one generating unit of 200MW capacity and two units of 100MW capacity each. Calculate the installed capacity, load factor, maximum demand and utilization factor. [4+4]

OR

- 9.a) What are the various losses while distributing power from power source to consumer?
 b) The following table shows the demand with respect to time [4+4]

Time(hours)	0-6	6-8	8-12	12-14	14-18	18-20	20-24
Load(MW)	50	60	70	60	80	90	50

Draw the load curve and determine the load factor.

10. What are common pollutants that release from thermal power plants? Explain different Methods to purify flue gases from sulphur oxides. [8]

OR

11. Explain the working of pressure measuring instrument with a neat sketch.[8]