Code No: 57023 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, May/June - 2015
POWER PLANT ENGINEERING
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

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1.a) Discuss how the India can survive in future for power generation? On what resources the power will be generated in future.
b) Explain different types of coal bunkers used in thermal power plants with suitable diagrams. [7+8]

2.a) What are different methods of dust collectors used in thermal power plants? Explain them with suitable diagrams.
b) What are the important components required for burning of pulverized coal in the steam boiler? Explain their significance. [8+7]

3.a) Explain the constructional details of auxiliary components used in diesel engine power plants along with the required diagrams.
b) How does the pressure lubricating system work in diesel engine? Explain the advantages and limitations of this type of lubrication. [8+7]

4.a) Draw the layout of combined cycle power plant and discuss the constructional features of each component and also describe the operating principle.
b) Differentiate among open, closed and semi closed gas turbine power plants with their applications. [7+8]

5.a) Describe the classification hydro electric power projects based on the principle of operation and water head and compare them.
b) How the water level in the reservoir and water flow through the dam measured in hydro electric power plants? Explain. [8+7]

6.a) What is solar energy? What is a solar collector? Explain briefly the solar collector used for power generation.
b) Explain the working principle of thermoelectric power generation and derive the equation for the estimation of thermal efficiency. [7+8]

7.a) How nuclear reactors are classified? Explain them with suitable examples.
b) Describe the fast breeder reactor with a neat sketch.
c) What are the merits of fast breeder reactor over sodium graphite reactor? [7+4+4]

8.a) Discuss in detail how energy cost is calculated for the power generation based on the fixed and variable costs by consideration of the depreciation principle.
b) A thermal power plant consists of 2 × 60 MW units running for 8000 hours and one 30 MW unit running for 2000 hours per year. Energy produced by the plant is 876×10^6 kwh per year. Determine load factor and plant use factor. Assume maximum demand is equal to the plant capacity. [8+7]

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