

Code No: 57023

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November - 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) Why the ash should be removed from the boiler grate? Explain the methods remove the ash.
  - b) Explain different development activities happening in India for the generation of power from alternate energy resources. [7+8]
  - 2.a) What is the need of combustion in steam boiler? Explain the mechanism of combustion in the boiler furnace.
  - b) Explain the significance and importance of purification of water in the steam boiler? Discuss how to purify the water from corrosion and contamination? [8+7]
  - 3.a) Explain different auxillary components required in internal combustion engine operated thermal power plants along with the simple suitable diagrams.
  - b) Discuss the starting equipment used in diesel engine power plants and discuss the mechanism to control this equipment. [8+7]
  - 4.a) Discuss the operating principle of combined cycle power plants along with the suitable diagrams and also explain the advantages and limitations.
  - b) How to convert a gas turbine thermal power plant into a combined cycle power plant? Explain the step by step procedure. [7+8]
  - 5.a) What are typical ponds and storage units suitable for installation of hydro electric power plants? Explain them.
  - b) What is the importance of spill ways in hydro electric power projects? Explain their practical applications. [8+7]
  - 6.a) What are the major sources for the tidal energy for power generation? Explain different sources available in India and the corresponding capacities of power generation.
  - b) Differentiate between thermoelectric and thermo ionic power generation systems. Explain why these are called direct energy conversion units? [7+8]
  - 7.a) How the graphite can be used in the nuclear power plant reactors? Explain the special requirement of graphite in the reactions.
  - b) How to make use of the gas for the cooling of a chemical reactor in the nuclear thermal power plants? Explain with a suitable diagram. [7+8]
  - 8.a) What are different effluents released from the thermal and nuclear power plants? Explain the methods to reduce these effluents.
  - b) Determine the annual coast of a feed water softner from the following data: Cost = Rs 80,000/-, Salvage value = 5%, Life = 10 years; Annual repair and maintenance cost = Rs 2500/-, Annual cost of chemicals = Rs 5000/-, Labour cost per month = Rs 300/- per day for two members; Interest on sinking fund = 5 %. [8+7]