

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, December - 2014

POWER PLANT ENGINEERING

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 75

Answer any Five Questions
All Questions Carry Equal Marks

- 1.a) What are different types of fuels used in thermal power plants? And discuss any one method to handle these fuels and explain the different handling equipments used.
- b) Explain different geothermal and wind energy resources in India.
- 2.a) Draw the layout of Cyclone furnace and explain the constructional design features and discuss the limitations of the furnace.
- b) Why water in the power plant needs to be purified? Explain any one method of water treatment systems used in steam power plants.
- 3.a) How the fuel is injected into the combustion chamber of diesel engine? Explain the evaporation and combustion principle of fuel droplets in the combustion chamber.
- b) Why supercharging is required in diesel engine power plants? Explain different methods of super charging.
- 4.a) What are different methods to improve the performance of a gas turbine power plant? Explain.
- b) Explain the operating principle of CAN type combustion chamber in comparison with TUBULAR combustion chamber for a gas turbine power plant.
- 5.a) Draw the performance characteristic curves of hydro power plants and explain the salient features and optimum design conditions.
- b) Explain the principle of re-circulating water hydro electric power plants with simple line diagram.
- 6.a) Draw a neat sketch MHD power generation plant and discuss the operating principle and the corresponding characteristic curves.
- b) Classify solar power plants based on temperature. Discuss any one with the help of neat sketch.
- 7.a) Discuss with the help of a neat sketch the working of Pressurized Water Reactor (PWR) plant.
- b) Is shielding is necessary for a nuclear plant? Discuss about thermal shielding and discuss the plant operating conditions without shielding.
- 8.a) Discuss the nature of load duration curves for any of the power plant and explain the load curve.
- b) The daily load for a power plant is given by the equation, $L = (290 + 12t - t^2)$ where "t" is time in hours from 0 to 24 hrs and "L" is load in MW. Calculate Maximum demand and Plant load factor.