Printed Pages: 4 **NEE-702/NEN-702**

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2012373 **Roll No.** | | | | | | | | | | |

B.TECH.

Regular Theory Examination (Odd Sem - VII), 2016-17

POWER STATION PRACTICE

Time : 3 Hours *Max. Marks : 100*

Section - A

1 Attempt all questions. Each question carries equal marks : (10×2=20)

a) What are the advantages of Renewable Sources of Energy?

b) What is the role of 'Load Factor' on the cost of electrical energy?

c) What is meant by the term 'Depreciation Reserve'?

d) Why is the efficiency of an open cycle gas turbine low?

e) What do you understand by the term 'load diversity'?

f) Name different types of winds?

g) Name different types of solar power collectors.

h) What is meant by the term 'Space heating'?

i) What is the function of 'Air Pre-heater'?

j) Discuss the roles of FD and ID fans employed in a thermal power station?

Section - B

Attempt any five questions. Each question carries equal marks. **(5×10=50)**

2. What do you understand by the term "Available Head"? How Impulse and Reaction Turbines being employed in Hydro Power Stations differ from those being employed in Thermal Power Stations?

3. Discuss the operation of Diesel Power Plant in brief. Why cannot Diesel Power Plants be employed to generate bulk power?

4. What is meant by 'Pumped Storage System'? How it differs form the conventional hydro-power generation? Explain with neat and clean illustration?

5. Discuss Anderson cycle system for ocean thermal energy conversion OTEC? and limitations associated with OTEC? Also determine the overall efficiency of an OTEC plant if surface warm water temperature is 29°C and deep cool water temperature is 4°C. Assume relative efficiency factor of the plant being 53.5%.

6. Explain the working of Gas Turbine Plants. What are the different types of Gas Turbine Plants? Discuss the layout of any one of them.

7. Explain the different types of substation and draw layout for the same. Give the working of each component of a substation.

8. Describe the principle of Solar Photovoltaic Energy Conversion and hence explain the operation of a Solar Cell. Also discuss the Solar Photovoltaic Power Plant.

SECTION - C

Attempt any two questions. Each question carries equal marks. **(2×15=30)**

9. What are different factors related to plants and consumer for power plant economics? Determine the generation cost per unit of energy from the following plant data – Installed capacity : 120 MW; Capital cost of plant: Rs. 40000 per kW; Interest and depreciation: 15%; Fuel consumption: 0.64 kg/kWh; Fuel cost : Rs. 1500 per 1000 kg; Salaries, repairs and other operating cost per annum: Rs. 50,000,000; Peak load: 100 MW; Load factor : 60%.

10. Why is a 'Moderator' necessary in a nuclear reactor? Distinguish between a 'Breeder Reactor' and a 'Converter Reactor'? Derive an expression for maximum conversion of fertile material in a Converter Reactor.

11. Explain Closed Cycle MHD Generation System with the

help of diagram. What are the advantages of MHD power generator? An MHD generator has plate area of 0.30 m^2; distance between plates 0.4 m; flux density 2.0 wb/m^2; average gas velocity 1000 m/sec and gaseous conductivity of 10 mho/m.

Calculate open circuited voltage and maximum power output.