Printed Pages : 4

EEE-042

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

PAPER ID : 120757

Roll No.

B.Tech.

(SEM. VIII) (ODD SEM.) THEORY EXAMINATION, 2014-15

POWER STATION PRACTICE

Time : 3 Hours] [Total Marks : 100

Note : Attempt all questions.

1 Attempt any **four** parts : **(5×4=20)**

(a) What are the different types of electrical energy resources ? Explain.

(b) Draw general layout and explain operation of thermal power plant.

(c) Explain advantages and disadvantages of thermal power plants.

(d) Classify hydro-electric plants.

(e) Explain the functions of followings for hydro-electric plants :

i) Reservoir
ii) Trash Rack
iii) Surge Tank
iv) Penstock
v) Spillway.

(f) Classify hydraulic turbines and explain any one of them.

Attempt any **two** parts : **(10×2=20)**

(a) What is a nuclear reactor ? Explain its different components with neat diagram. How it is controlled in nuclear power plant ?

(b) Explain the operating principle of gas turbine plant with the help of neat diagram. How its efficiency can be improved ? Explain any one method in detail ?

(c) Explain the working of diesel plant with the help of block diagram. Also mention its advantages, disadvantages and applications.

Attempt any **two** parts : **(10×2=20)**

(a) What are the different types of substations ? Explain. Also explain different type of bus-bar arrangements.

(b) Define the following terms related to power plant economics :

i) Load curve
ii) Demand factor
iii) Load factor
iv) Capacity factor
v) Diversity factor.

A generating station has a maximum demand of 25MW, a load factor of 60% and plant capacity factor of 50%. Find :

i) Average demand

ii) Plant capacity

iii) Reserve capacity

iv) Daily energy produced.

(c) What are the causes and effect of low power factor ? What are the advantages of high power factor ? Explain any one method for power factor improvement.

Attempt any **two** parts : **(10×2=20)**

(a) What do you understand by economic load scheduling ? Explain, and derive co-ordination equation :

i) neglecting transmission losses and

ii) considering transmission losses.

(b) Assume that the fuel inputs per hour for units 1 & 2 are given by :

$F_1 = 0.2P_1^2 + 40P_1 + 180$ Rs./hr

$F_2 = 0.25P_2^2 + 30P_2 + 160$ Rs./hr

The maximum and minimum loads on the units are 120 MW and 20 MW respectively. Determine the minimum cost of generation when 180 MW load is supplied for 24 hrs. Neglect the transmission losses. If the load is equally shared by both the units, determine the savings obtained by loading the units as per the equal incremental production cost.

(c) Explain hydrothermal scheduling with various power system constraints.

5 Attempt any **four** parts : **(5×4=20)**

(a) Write in brief about the power crisis and its remedial measures in Indian power sector.

(b) Explain thermionic and thermoelectric converters for direct conversion of solar heat to electricity.

(c) Explain the principle of MHD generation. Also explain its advantages.

(d) Describe layout of wind power generation. Also derive the output power equation of wind turbine.

(e) What is geothermal energy? How it is utilized for power generation?

(f) Define tidal energy and tidal barrage. Name different tidal power schemes.

———