Total No. of printed pages = 4

CAI-502/GT&DoP/5th Sem/2016/N

GENERATION, TRANSMISSION AND DISTRIBUTION OF POWER

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No.1 and any *four* from the rest.

1. (a) What do you mean by base load and peak load power station ? 2

   (b) Define diversity factor and load factor. 2

   (c) Define transmission efficiency. 1

   (d) Write the full form of ACSR. 1

   (e) Which prime mover is used in the diesel engine power station ? 1

[Turn over

(f) How energy conversion takes place in the hydroelectric power plants ? Show the different stages of energy conversion. 1

(g) Define calorific value of fuel. 1

(h) Why moderators are used in nuclear reactors ? Write the name of two good moderators. 1+2=3

(i) Prove that : 2

1 KWh = 860 KCal.

2. (a) What are the advantages and disadvantages of hydroelectric power stations ? 9

(b) How hydro plants are classified according to the water flow regulation ? 5

3. (a) Write about some important factors which are to be considered before the selection of site of a thermal power plant. 8

(b) What are the different types of steam condensers used in a steam power plant ? Write briefly about them. 6

4. (a) Draw a neat sketch to show how electrical energy is transmitted from the generating stations and finally received at the load centres at 415 volts, 3-ϕ after stepping down the voltage levels at different sub-stations in its way. 5

(b) Write about the following connection schemes of distribution system : 3×3=9

(i) Radial system

(ii) Ring-main system

(iii) Inter-connected system.

5. (a) Why water treatment is necessary for boilers in steam power plants ? 5

(b) A diesel power station has the following data : 6

Fuel consumption / day = 1000 kg

Units generated / day = 4000 KWh

Calorific value of fuel = 10,000 KCal/kg

Alternator efficiency = 96%

Engine mech. efficiency = 95%

Estimate :

(i) Specific fuel consumption

(ii) Overall efficiency and

(iii) Thermal efficiency of engine.

(c) Why cooling towers are used in thermal power palnts ? 3

6. (a) What do you mean by binding energy and mass defect in nuclear physics ?

$2\frac{1}{2}+2\frac{1}{2}=5$

(b) Why control rods are used in nuclear reactors ? Define the multiplication factor and what do you mean by subcritical and super critical reactors ? What materials are used in control rods ? How the chain reaction is controlled by means of control rods in nuclear reactors ? 3+1+2+1+2=9

7. Write short notes on any *two* : 7×2=14

(a) Advantages and applications of Diesel Power Station.

(b) A.C vs. D.C transmission.

(c) Parallel operations of alternators.

(d) Surge tank and Penstocks in hydroelectric plant.

(e) Advantages and disadvantages of Nuclear Power Plants.