4TH SEM./ ELECT./ELECT. & MECH./ ELECT. & ETC./EE(I & C)/ 2023(S)

TH-4 Generation Transmission & Distribution

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions   2 x 10

    a. Classify overhead transmission lines on its voltage and distance.

    b. What factors are taken into account while selecting the site for a thermal power plant?

    c. What is feeder & distributor?

    d. A generating station has connected a load of 43MW and a maximum demand of 20MW; The units generated being 61.5×10^6 per annum. Calculate (i) demand factor (ii) load factor.

    e. Define flat rate tariff.

    f. What is grading of cables?

    g. Name the important components of an overhead transmission line.

    h. State Kelvin's law.

    i. What do you mean by sheathing of cable?

    j. Why are insulators used with overhead lines?

2. Answer Any Six Questions   6 x 5

    a. What is corona? What are the factors which affect corona in overhead transmission line?

    b. Draw a LT substation layout and name its important components.

    c. Describe the Murray loop test method for location of short circuit fault in UG cable.

    d. Derive an expression for voltage regulation of short transmission line.

    e. What is electric power supply system? Draw a single line diagram of a typical a.c power supply scheme.

f. What are the reasons of adopting EHV AC transmission? Write its limitations.

g   A consumer has a maximum demand of 200KW at 40% load factor. If the tariff is Rs.100/KW of maximum demand plus 10 paisa per kWh, find the overall cost per kWh.

3	Describe the function of following elements in Nuclear Power Plant.(a) Moderator (b) Control Rod (c) Nuclear Reactor (d) Heat Exchanger (e) Turbine	10
4	Write briefly about different types of lying of underground cable.	10
5	An overhead transmission line at a river crossing is supported from two tower at heights of 50 m and 100m above the water level. The horizontal distance between the towers is 400m. If the tension in the conductor is 1800kg, find the clearance between the conductor and water at a point mid-way between the supports. Weight of conductor is 1 kg/m.	10
6	A 3-phase,50Hz overhead transmission line 100km long has the following constants: Resistance/km/phase=0.1 ohm Inductive reactance/km/phase=0.2 ohm Capacitive susceptance/km/phase=0.04×10-4siemen. Determine (i) the sending end current (ii) sending end voltage (iii) sending end power factor and (iv) transmission efficiency when supplying a balanced load of 10,000 kW at 66kV, p.f. 0.8 lagging. Use nominal T method.	10
7	What are the causes of Low power factor and explain the methods for improving the power factor in power system.	10