BE Semester-VII (Electrical) Question Bank

Power System Practice Design

All questions carry equal marks(10 marks)

Q.1	Explain the following distribution systems with figures. 1. Radial system. 2. Parallel or loop system. 3. Network or grid system.
Q.2	What are corona losses? Discuss its significance and permissible limit. Explain Peek's and Peterson's formula for calculating the corona loss.
Q.3	What is lamp flicker? What are its causes? What type of loads are responsible for it? How can it be reduced?
Q.4	Discuss the following factors to be taken into consideration in the mechanical design of a transmission line. 1. Loading on the conductors. 2. Span, sag and tension. 3. Clearance from the ground.
Q.5	Draw the schematic of an HVDC system and hence explain its principle of operation. Discuss various types of HVDC links used.
Q.6	How is the selection of arrester voltage rating, discharge current and discharge voltage done?
Q.7	Explain the use of bundled conductors in EHV transmission lines. Also explain how the spacing, selection of size and number of conductors for the EHV lines is done.
Q.8	Discuss Kelvin's law to find the most economical conductor size. What are the limitations of this law?
Q.9	Write a note on Gas Insulated substation.
Q.10	Why are earth wires used? Discuss the methods used to improve the effectiveness of the earth wires.
Q.11	What are the merits and demerits of HVDC transmission ?
Q.12	A single phase a.c. distributor 500 m long has a total loop impedance of (0.02 +j0.04) Ω and is fed from one end at 250 V. It is loaded as under: 1. 50 A at unity power factor, 200 m from the feeding point. 2.100 A at 0.8 power factor lag, 300 m from the feeding point. 3. 50 A at 0.6 power factor lag, at the far end. Calculate the total voltage drop in the distributor and the voltage at the far end.
Q.13	A two conductor street main AB, 500 meters in length is fed from both the ends at 250 V. Loads of 50 A,60 A, 40 A and 30 A are tapped at distances of 100 m, 250 m, 350 m and 400 m from the end A respectively. If the cross section of the conductors is 1 cm^2 and specific resistance of the material of the conductors is 1.7μ Ω-cm, determine the minimum consumer voltage.
Q.14	Find the most economical cross-section of a 3 core distributor cable 250 m long supplying a load of 80 kW at 400 V and 0.8 power factor lagging for 4000 hours per annum and open circuited for the remaining of the year. The cost of the cable including installation is Rs. (15a +25) per meter where 'a' is the area of each conductor in sq. cm. Interest and depreciation rate is 10 % and the cost of energy wasted is 10 paisa per unit. The resistance per km of the conductor of 1 cm^2 cross section is 0.173 Ω.

Q.15	An overhead transmission line conductor is subjected to a horizontal wind load of 1.78 kg/m and a vertical ice loading of 1.08 kg/m. If the maximum permissible sag is 6 meters and the ultimate strength is 7950kg, calculate the permissible span between the two supports allowing a safety factor of 2. Weight of the conductor is 0.844 kg/m.
Q.16	Define Surge Impedance Loading. Explain the significance of it in Transmission Line design.
Q.17	Differentiate between shunt and series compensation.
Q.18	What are the factor affected Corona effects and loss with standard formula.
Q.19	Explain the factors while considering the size and locations of Sub Station.
Q.20	Explain the difference between Ring and Radial type Distribution System.
Q.21	Discuss in detail the steps in planning and designing electrical distribution schemes
Q.22	Define Insulation Coordination. Explain Insulation Co-ordination curves.
Q.23	Explain the different issues of Interconnections with Wind and solar PV.
Q.24	Explain single line diagram of HVDC Transmission system.
Q.25	Explain the Merits and Demerits of HVDC Transmission System.
Q.26	Write short notes on EHV System in India.
Q.27	What are the equipments are used in substation give importance of each equipments
Q.28	Explain design of earthing grid with suitable diagram
Q.29	What do you mean by tolerable step and touch voltage, actual step and touch voltage?
Q.30	Shot notes on measurement of earthing reistance
Q.31	Shot notes on insulation co-oordination.
Q.32	Determine ABCD constants and Regulation of 3-phase Transmission line considering following data. Power = 85,000 kW, p.f.= 0.9 lagging, Distance = 160 km, Voltage = 230 kV, Spacing of conductors = 10.2 m , Resistance/km = 0.22 Ω, outer radius R = 0.827 cm, Self GMD = 0.768 R
Q.33	The following loads are connected to a three phase four wire 415/230 V distribution system. 1. A three phase 15 kW load at 0.9 power factor lagging. 2. A three phase 8 kW load at unity power factor. 3. A single phase 1.5 kW load at 0.8 power factor lagging between the phase R and neutral. 4. A single phase 3 kW load at 0.9 power factor leading between the phase Y and neutral. 5. A single phase 2 kW load at unity power factor between the phase B and neutral. The phase sequence is RYB. Calculate the currents in each line and current in Neutral.
Q.34	It is proposed to transmit 100 MW at 0.9 power factor lagging over a distance of 200 km. Select the line voltage, number of circuits, proper conductor and span for this line making use of the tables attached and hence find the line parameters and line regulation.