



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.
 11. Use of non-programmable calculator is permitted.

1. a) Prove that percentage power loss in AC transmission line is independent of its length. **6**
- b) A power of 2150 MW is to be transmitted over a distance of 920km on a voltage level of 400kv and 750 kv. line reactance and resistance are as follow. **7**

	400 kv	750 kv
Line Resistance Ω /km	0.031	0.0136
Line Reactance Ω /km	0.327	0.272

Assume $\delta = 30^\circ$ and series compensation of 50%. Suggest

- i) No of ckt ii) Total power loss iii) Power loss per km.

OR

2. a) Derive the expression for electric field of a line charge of Two-conductor AC line considering the effect of ground. **6**
- b) A single circuit transmission line is placed above ground to study the High voltage effect. The conductors are ASCR with diameter 0.0635m and separated by a distance of 6m. The line height is 21m above ground. **7**
- i) Find Maxwell's potential coefficient.
 - ii) Find Charge coefficient of voltage are ± 400 kv.
 - iii) Check weather corona take place on the surface.

3. a) What is critical disruptive voltage? Discuss the factors affecting corona power loss. **7**
- b) Find the critical disruptive voltage and critical voltage for local and general corona on a 66kv, 3 ϕ overhead line consisting of three stranded copper of an equilateral triangle. Air temperature and pressure are 21°C & 73.6 cm of Hg respectively. The conductor diameter is 10.4mm. **7**

OR

4. a) What is the effect of high electrostatic field on human beings, animal and plants. **7**
- b) Explain charge-voltage diagram with corona. **7**
5. a) Compare EHVAC and HVDC transmission line with respect to. **8**
- i) Bulk power transmission.
 - ii) Line compensation.
 - iii) Skin effect.
 - iv) Power transfer and reactive power.

