EE/EX-227

B.E. IV Semester

Examination, June 2017

Choice Based Credit System (CBCS)

Power System-I

Time : Three Hours] [Maximum Marks : 60

Note : i) Attempt any five questions.

ii) All questions carry equal marks.

1. a) Explain the effect of high transmission voltage on power system economy.

b) Explain the difference between feeder, distributor and service mains?

2. a) Explain the problems associated with large interconnected systems.

b) Define demand factor and load factor explain the values of demand factor and load factor are always less than one.

3. Derive the expression for calculating the internal and external flux linkages of conductor carrying current. Hence deduce an expression for the total inductance of a single phase line.

4. a) Explain the necessity of grading of cables. Explain different type of grading the cables.

b) A single core, lead covered cable is to be designed for 66kV to earth. Its conductor radius is 10mm and its insulating materials A, B and C have relative permittivities of 5, 4 and 3 respectively and corresponding permissible stresses of 3.8, 2.6 and 2.0 kV/mm (rms) respectively. Find the minimum diameter of the lead sheath.

5. a) Derive A, B, C and D constants for medium transmission line.

b) A three phase, 50Hz transmission line, 40km long delivers 36MW at 0.8 power factor lagging at 60kV per phase. The line constants per conductor are R=2.511, L=0.1 H, C=0.25gF. shunt leakage may be neglected. Calculate efficiency, voltage regulation, voltage, Current, Power factor and active power.

6. a) Explain different methods for achieving uniform distribution of voltage along the insulators.

b) A string of suspension insulators consists of four units. The capacitance between each link pin and earth is one-tenth of the self capacitance of a unit. The voltage between the line conductor and earth is 100kV. Calculate string efficiency.

7. a) Explain modified Kelvin's law for most economical size of the conductor.

b) A three phase 4-wire system is used for lightening compare the amount of conductor material required with that needed for a 2 wire d.c. system with same lamp voltage. Assume the same losses and balanced load the neutral wire has half the cross section of the other.

8. Write short notes on any two

(a) Sag template (b) Method of voltage control

(c) Bundle conductors (d) Ferranti effect