SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL No: | | | | | | | | | | | | **Total number of pages:[ ]**

B.Tech. || EE || 4th SEM.

Power System 1

Subject Code:BTEE-405

Paper ID:

Max Marks: 60

Time allowed: 3 Hrs

Important Instructions:

- **All questions are compulsory**
- **Assume any missing data**
- **Additional instructions, if any**

Q. 1. Short-Answer Questions:

a) What are the advantages of AC over DC power distribution system.
b) Why sag cannot be made zero in transmission lines?
c) What is skin effect?
d) What are the causes of voltage drop and power loss in transmission line?
e) Why the metallic sheath is provided in underground cables?
f) Why aluminum is preferred as conductor material than copper in cables?
g) Define term ACSR?
h) What factors decide the height of a pole or tower?
i) Discuss various important properties the insulator must possess.
j) How level of transmission voltage govern the size of conductor?

PART B (5×8marks)

Q. 2. Discuss the comparison of conductor material required in DC three wire system and three phase three wire system. CO1

OR

Discuss the comparison of conductor material required in DC phase two wire system and three phase three wire system.

Q. 3. How would you apply the formula for sag calculation if the overhead line has the following data Span length = 160 m, conductor Dia. = 0.95cm, weight per unit length of conductor= 0.65 kg/m, Ultimate stress = 4250 kg/cm^2 Wind pressure =40kg/cm^2 factor of safety= 5. CO1

Derive an expression for string efficiency of a string with five discs.

Q. 4. Describe the general construction of cables. What are the necessary requirements of a cable? CO3

OR

Write a note on laying of cables.

Q. 5. Derive an expression for calculation of sending end voltage and current in terms of receiving end parameters for nominal T model. CO2

OR

Derive an expression for calculation of sending end voltage and current in terms of receiving end parameters for nominal π model.

Q. 6. A three phase transmission line has resistance, inductance and capacitance per phase of 10 ohm, 0.1 ohm and 0.9 micro farad delivers a load of 35 MW at 132 kV and 0.8 p.f. lag. Determine sending end voltage. CO4

OR

The three phase transmission line conductors are arranged equally 3 meters apart. The diameter of each conductor is 4 cm. determine inductance per km per phase.