

04

Q.P. Code: 20824

[Time: Three Hours]

[Marks:80]

Please check whether you have got the right question paper.

- N.B.:- (1) Question No.1 is compulsory.
(2) Attempt any Three questions out of remaining five questions.
(3) Assume suitable data if necessary and justify the same.

Q1. Answer the following questions.

- A) Explain Skin effect with diagram. 05
B) Prove that PU impedance of transformer can be made same referred to both winding by selecting proper voltage bases on either sides. 05
C) Explain typical AC system with single line diagram. 05
D) Compare overhead and underground system. 05

Q2a) Explain effect on line capacitance. Also explain method of images. 10

Q2b) A 3-phase 50 Hz overhead transmission line has the following distributed constants.. 10
Resistance= 28 ohms , Inductive reactance = 63 ohms
Capacitive susceptance= 4×10^{-4} mho
If load at the receiving end is 75MVA at 0.8 pf lagging with 132 KV between lines calculate Voltage, Current, power factor at the sending end. Use nominal T method.

Q 3 a) What is String efficiency and explain the methods of improving String efficiency? 10

Q3 b) A 3-phase, 50Hz, 132 KV overhead line has conductor placed in a horizontal plane 4.56 m apart. Conductor diameter is 22.4 m. If the line length is 100km, calculate the charging current per phase. 10

Q4 a) Derive mathematical expression for capacitance of single core cable. 10

Q4 b) A 3 phase transmission lines have the generalized constants 10
 $A_1=D_1= 0.98 \angle 2^\circ$, $B_1 = 28 \angle 69^\circ$ ohm , $C_1= 0.0002 \angle 88^\circ$ mho,
 $A_2=D_2= 0.95 \angle 3^\circ$, $B_2=40 \angle 85^\circ$ ohm, $C_2=0.0004 \angle 90^\circ$ mho
They are connected in series and deliver a load current of 200A at 0.95 pf at 110KV.
Determine the sending end voltage and current.

Q 5 a) Explain different method of neutral grounding. 10

Q5 b) A transmission line has a span of 150m between level supports. The Cross sectional area of the conductor is 1.25 cm² and weight 100kg per 100 m. If the breaking stress is 4220 Kg/cm². Calculate the factor of safety if the sag of the line is 3.5 m. Assume a maximum wind pressure of 100 Kg per sq meter. 10

Q6) Solve any Two

a) Explain grading of cables and its types. 10

b) Explain power flow through transmission line. 10

*****c) Derive expression for capacitance of 3-Phase line with equilateral spacing. 10
