

Total No. of Questions : 4]

SEAT No. :

PB-115

[Total No. of Pages : 2

[6269]-329

T.E. (Electrical) (Insem)

POWER SYSTEM - II

(2019 Pattern) (Semester-II) (303148)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3 or Q.4
- 2) Use of calculator is allowed.
- 3) Assume Suitable data if necessary

Q1) a) Define surge impedance loading and write its formula with unit. [3]

b) Prove that complex power is $S = VI^*$. [5]

c) In 132kv transmission line has following generalized constant: [7]

$$A = D = 0.96 \angle 2^\circ$$

$$B = 100 \angle 85^\circ \Omega$$

$$C = 0.0004 \angle 90^\circ S.$$

If both end voltage are maintained at constant voltage of 132kv and phase angle difference is 30° . Calculate

- i) Receiving end active power
- ii) Sending end active power
- iii) Transmission efficiency.

OR

Q2) a) What are the methods to improve surge impedance loading? [3]

b) State the following statements are true or false with proper mathematical justification: [5]

- i) In the EHV transmission line, receiving end voltage is less than sending end voltage under no load condition.
- ii) Adding a series capacitor in transmission improves the power transfer capability of the line.

c) Derive the equation for ABCD parameters for long transmission line. [7]

P.T.O.

- Q3)** a) List the classification of transmission line according to voltage levels. [3]
 b) Derive the equation for critical disruptive voltage of corona. [5]
 c) A power of 12000MW is required to be transmitted over a distance of [7]
 1000km. At voltage level of 750kV and 1200kV at 50Hz. The average
 values of line parameters are as given below :

System voltage(kV)	750	1200
r (Ω /phase/km)	0.0136	0.0027
x (Ω /phase/km)	0.272	0.231

Determine

- Possible number of circuits required with equal magnitude of sending and receiving end voltages with 30 degree phase difference.
- The current transmitted per phase
- Total line losses.

OR

- Q4)** a) List the factors affecting corona loss. [3]
 b) Elaborate any five advantages of EHVAC transmission line in details? [5]
 c) A three phase transmission line has conductor radius of 0.50 cm and are spaced 3 m in an equilateral arrangement. The air temperature is 26° Celsius and pressure is 74cm of Hg. Surface factor is 0.85. Take breakdown strength of air 30kV/cm (peak). Determine the [7]
- Disruptive critical voltage in kV/ph
 - Local visual critical voltage in kV/ph. Irregularity factor for local visual corona is 0.72.
 - Visual critical voltage in kV/ph for general corona. Irregularity factor for general visual corona is 0.82

