

Total No. of Questions : 6]

SEAT No. :

P527

[Total No. of Pages : 2

TE/Insem/APR-114
T.E. (Electrical) (Semester - II)
Power System - II
(2015 Pattern)

Time : 1 Hour]

[Max. Marks : 30

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Q1) a) Prove that reactive power flow in the transmission line proportional to voltage drop along the line. **[5]**

b) A three phase 132kV overhead line delivers a load of 50 MVA at 132 KV and 0.8 p.f. lagging at its receiving end. The constants of the transmission line are : $A=D=0.98 \angle 3^\circ$, $B=110 \angle 75^\circ \Omega/\text{ph}$, $C=0.0005 \angle 88^\circ \text{ S/ph}$. Determine: **[5]**

- i) Sending end voltage and power angle.
- ii) Sending end Current.

OR

Q2) a) Prove that apparent power $S=VI^*$. Hence explain concept of complex power. **[5]**

b) $A = 275\text{kV}$, three phase line has the following line parameters:

$A=0.93 \angle 1.5^\circ$, $B=115 \angle 77^\circ$ If the receiving end voltage is 275kV determine:

- i) Sending end voltage required if a load 250MW at 0.85 p.f. (lagging) is being delivered at receiving end.
- ii) The Maximum power that can be delivered if the sending end voltage is held at 295kV. **[5]**

Q3) a) Explain power handling capacity and power loss at different voltage levels. **[5]**

b) Explain the advantages and drawbacks of EHVAC transmission. **[5]**

OR

Q4) a) Explain the phenomenon of corona and state various methods to reduce it. [4]

b) Find the disruptive critical voltage and visual critical voltage for local and general corona for a three phase line consisting of 21mm diameter conductors spaced in 6 m delta configuration. Take temperature 25°C, pressure 73cm of mercury, surface factor 0.84, irregularity factor for local visual corona 0.72 and for general (decided) visual corona 0.82.[6]

Q5) a) Derive static load flow equation for 'n' bus system. [5]

b) Determine the Y bus for the three bus system. Neglect the shunt capacitances of the lines. [5]

The line series impedances are as follows.

Bus code	Impedance (pu)
1-2	$0.08+j0.24$
1-3	$0.02+j0.06$
2-3	$0.06+j0.18$

OR

Q6) a) Explain formulation of Y_{bus} using singular transformation. [5]

b) Draw per unit reactance diagram of following system assuming base of 30MVA, 11kV on generator. [5]

