

Code No: C5608

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH I SEMESTER EXAMINATIONS, APRIL/MAY 2012
EXTRA HIGH VOLTAGE TRANSMISSION
(POWER SYSTEMS (HIGH VOLTAGE))

Time: 3hours

Max.Marks:60

Answer any five questions
 All questions carry equal marks

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- 1.a) State advantages and disadvantages of EHV AC transmission.
- b) A power of 2000MW is to be transmitted from a super thermal power station in central India over 800 km to Delhi. Find the number of circuits required with 50% series capacitor compensation, and calculate the total power loss and loss per km, if the transmission voltage is 500kV and 750 kV respectively.
- 2.a) Write short notes on the Bundled conductors used in e.h.v. a.c transmission.
- b) The capacitor matrix of a 500 kV horizontal configuration line is

$$[c] = \begin{bmatrix} 10.2 & -1.45 & -0.35 \\ -1.45 & 10.4 & 1.45 \\ -0.35 & -1.45 & 10.2 \end{bmatrix} nF / km$$

Diagonalize the matrix by evaluating suitable transformation matrix [T] and its inverse $[T]^{-1}$.

3. The dimensions of a 3- phase 400 kV horizontal line shown in fig 1. are: H=15m, s = 11m phase separation. Conductor 2x3.18 cm dia and B = 45.72 cm. Calculate i) the matrix of inductances per km for untransposed configuration, and ii) the same when there is complete transposition.

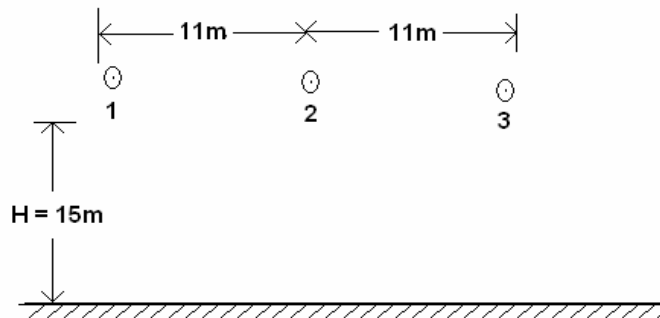


Fig . 1

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4. A 735 kV line has $N= 4$; $r = 0.0176\text{m}$, $B = 0.4572\text{m}$ for the bundled conductor of each phase. The line height and phase spacing in horizontal configuration are $H = 12\text{m}$, $s = 12\text{ m}$. Calculate the maximum surface voltage gradients on the centre phase and outer phase using Mangoldt formula.
5. Explain how Audible noise is generated in EHV AC lines? State their characteristics.
6. Explain different corona loss formulae used in EHV.A.C lines.
7. Explain the voltage control in EHV AC lines by using
i) Synchronous condensers and ii) Cascade connection of shunt and series compensation.
8. Explain different SVC schemes introduced in EHV AC lines.
