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# B.E. (Electrical) (Semester - VIII) Examination, May - 2015
## EHVAC
## Sub. Code : 49431

**Day and Date : Tuesday, 12 - 05 - 2015** **Total Marks : 100**

**Time : 02.30 p.m. to 05.30 p.m.**

**Instructions :** 1) **Attempt any three questions from each section.**

2) **Draw neat diagrams wherever required.**

## SECTION - I

*Q1)* a) What are bundled conductors? Compare them with stranded conductors. Derive the expression for GMR of bundled conductor. **[8]**

b) What insulation coordination? Explain voltage withstand levels of protected equipment and insulation coordination based on the lightning. **[8]**

*Q2)* a) Explain the diagonalisation procedure to obtain Eigen vectors from inductance matrix of 3-phase transmission line. Interpret them as the modes of propagation. **[10]**

b) Derive the expression for voltage gradient distribution on sub-conductors of a bundle. **[8]**

*Q3)* a) Explain the charge-voltage diagram of corona. Hence derive the expression for corona loss. **[8]**

b) Explain the generation and characteristics of audible noise due to corona. State the limits of audible noise. State the factors on which the audible noise depend. **[8]**

*Q4)* a) Derive the expression for voltage and current at any point on a transmission line with distributed parameters. Hence find the expression for V & I in case of line termination by : **[8]**

i) Open circuit ii) Short circuit.

b) Explain the effect of resistance on performance of EHVAC lines. Explain heat balance equation for a conductor of line. **[8]**

*P.T.O.*

## SECTION - II

*Q5)* a) Explain the importance of tower-footing resistance in over-voltage protection. Explain counter poise with neat sketch. [8]

b) Using method of residue, show that the open end voltage response for a step input when line losses are neglected is the sum of step input and rectangular wave of amplitude V and fundamental frequency $f_0 = \frac{1}{4T}$. [8]

*Q6)* a) Explain how overvoltages are produced on transmission line due to switching, lightning and interruption of low inductive current. [8]

b) Explain the construction of receiving end circle diagram. [8]

*Q7)* a) Compare the performance characteristics of sic arresstor with ZnO arrestor. State their advantages and disadvantages. [8]

b) Describe with neat sketch the mechanism of lightning stroke. [8]

*Q8)* Write short notes on any three : [18]

a) Sub synchronous resonance.

b) Advantages of static VAR compensators.

c) Attenuation of travelling waves due to corona loss.

d) Bewely lattice diagram.

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