

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SECOND SEMESTER M.TECH DEGREE EXAMINATION, MAY 2016

Electrical and Electronics Engineering

(Power Systems)

04 EE 6436—Ehv Ac and Dc Transmission

Max. Marks : 60

Duration: 3 Hours

PART A

Answer All Questions

Each question carries 3 marks

1. Explain the phenomena of corona and factors effecting corona.
2. What are the limitations of audible noise.
3. Explain CIGRE formula.
4. What is Ferro resonance.
5. Discuss the design of insulation for EHV AC lines considering lightning and switching over voltages.
6. Discuss briefly on the classification of HVDC links
7. Draw and explain the functional block diagram of an HVDC system model.
8. Describe the types of harmonics produced by the converters on AC side and DC side.

PART B

Each question carries 6 marks

9. Explain in detail Corona power loss.

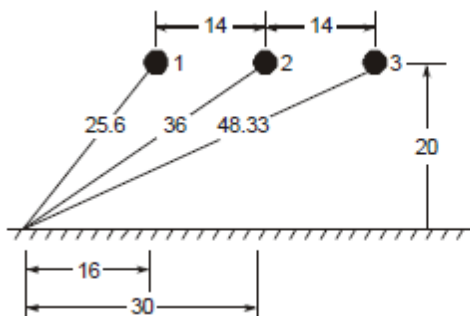
OR

10. Derive the expression for power loss over differential length dx when a voltage wave travelled and is affected by corona by taking linear functional relation.

11. What is RI excitation function? Explain.

OR

12. A 735kV line has the following details: $N=4$, $d=3.05\text{cm}$, $B=\text{bundle spacing}=45.72\text{ cm}$, height $H=20\text{m}$, phase separation $S=14\text{m}$ in horizontal configuration. By Mangoldt formula ,the max conductor surface voltage gradients are 20 kV/cm and 18.4kV/cm for the centre and outer phases respectively. Calculate the SPL or AN in dB(A) at a distance of 30m along ground from centre phase(line centre). Assume that microphone is kept at ground level.



13. Discuss the response of a series RLC circuit when excited by a STEP and SINE .Also include effect of trapped charges.

OR

14. Explain the overvoltage caused by interruption of capacitive currents.

15. Explain the high voltage testing of AC using high speed oscilloscope.

OR

16. Explain the layout of EHV laboratory

17. Differentiate EHV AC and DC transmission.

OR

18. Explain the phenomena arc back and arc through in converters.

19. Explain the basic principle of HVDC link control and what are the factors that influence selection of control characteristics.

OR

20. Discuss on the problems associated with DC systems connected to weak systems and methods of dealing with such problems.