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Number of pages : 2

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER M.TECH DEGREE EXAMINATION, JULY 2018

Electrical and Electronics Engineering

(Power Control and Drives)

01EE7411: EHVAC and DC Transmission

Max. Marks : 60 Duration: 3 Hours

*Answer **any two questions** from each part*

Part A

1. Explain the major equipments in HVDC substation with neat schematic diagram. (9 marks)

2. Explain the firing angle control of HVDC converters in detail. (9 marks)

3. a) Explain the general equation of dc power flow in HVDC converters. (5 marks)

   b) Explain the constant current control method used with HVDC converters with a schematic diagram. (4 marks)

Part B

4. Explain the requirement of reactive power in HVDC converter station. (9 marks)

5. Draw and explain configuration of sea electrode and also compare it with shore electrode. (9 marks)

6. a) Write the problems of telephonic interference of HVDC transmission system and also write the steps for reducing the telephonic interference. (5 marks)

   b) Write short notes on HVDC lightning arresters with parallel branches for high energy. (4 marks)

Part C

7. A 3 phase overhead transmission line has equivalent spacing of 5.5m between conductors and conductor diameter is 3 cm. Atmospheric temperature is 10°C and barometric pressure is 740 mm of Hg. Surface irregularity factor for stranded conductors is 0.9. Calculate the following.

   i) Critical surface stress peak value, for fair weather and visual corona, for both centre conductor and side conductor.

   ii) Critical disruptive phase voltage and phase to phase voltage for visual corona under fair weather condition (12 marks)

8. Explain the significance of creepage distance for AC insulators and DC insulators in insulation coordination. (12 marks)

9. a) Explain the corona phenomenon in HVDC transmission system. (6 marks)

   b) Explain the process of overvoltage on the ac side of HVDC substation. (6 marks)