

**B.TECH.****THEORY EXAMINATION (SEM-VIII) 2016-17****EHV AC & DC TRANSMISSION****Time : 3 Hours****Max. Marks : 100****Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.****SECTION – A****1. Attempt all of the following:****10 x 2 = 20**

- What is the need of the EHV AC transmission? Explain.
- What are the causes of over voltage?
- List the factors which affect corona.
- Why switching operation leads to rise in over voltages?
- Explain Streamer's Theory as regards the breakdown of gaseous dielectrics in uniform field gap.
- What is meant by "surge impedance loading"?
- What is meant by "insulation coordination"?
- What are the effects of pollution on the performance of EHV lines?
- State and briefly explain Paschen's law.
- What are the applications of Multi Terminal DC Systems (MTDC)?

**SECTION – B****2. Attempt any five of the following questions:****5 x 10 = 50**

- Discuss the method of measuring high impulse currents.
- Explain the sub-synchronous problem in EHV lines and discuss the counter measures to minimize it.
- The following data for a 750kV line are given. Calculate the corona loss current.  
Rate of rainfall,  $\rho = 5\text{mm/hr}$ ;  $K = 5.35 \times 10^{-10}$ ; total fair-weather loss  $P_{FW} = 5\text{kW/km}$ ;  $V = 750\text{kV}$  line-to-line;  $H = 18\text{m}$  (height);  $S = 15\text{m}$ , (phase spacing);  $N = 4$  (sub-conductors each of  $r = 0.0175\text{m}$  with bundle spacing);  $B = 0.4572\text{m}$  (Bundle radius  $R = B/\sqrt{2} = 0.3182\text{m}$ ). Use surface gradient on centre phase for calculation.
- What is meant by extinction angle control? What are its limitations?
- Discuss the method of reversal of power in HVDC link. Why is this feature needed?
- What are the various types of HVDC links? Explain briefly.
- What are harmonics on DC side of the converter? Explain DC harmonics filters.
- What is audible noise? How the noise generated and what are its characteristics?

**SECTION – C****Attempt any two of the following questions:****2 x 15 = 30**

- Explain the measurement of high voltage by sphere gaps and potential dividers. Also discuss the advantages and disadvantages of sphere gaps method over potential dividers method.
- Explain the voltage multiplier circuits. Also explain the cascade connection of transformer for producing very high AC voltages.
- Explain the operation of 12-pulse converter and its requirement in HVDC transmission system.