Code No: **RT41022** **R13** **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, October/November - 2019

HVAC AND DC TRANSMISSION

(Electrical and Electronics Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any THREE questions from Part-B
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PART–A *(22 Marks)*

1. a) What is the necessity of EHVAC transmission? Explain. [3]
   b) List out the factors responsible for the generation of audible noise by a transmission line? Also write the names of objectionable disturbances caused in over head EHVAC transmission line? [4]
   c) List the advantages and disadvantages of homo polar HVDC links over other types of links. [3]
   d) Explain Inverse cosine control scheme for firing pulse generations. [4]
   e) What are the conventional control strategies of reactive power? Explain briefly. [4]
   f) Define telephone interference Factor and Explain how it varies with harmonic order. [4]

PART–B *(3x16 = 48 Marks)*

2. a) Show that the variation of surface voltage gradient on the periphery of a sub-conductor of bundled conductor follows cosine law. [8]
   b) Explain the various mechanical considerations done in EHVAC Transmission lines and how we can reduce the effect of these? [8]

3. a) What is the significance of charge-voltage diagram in detail? [8]
   b) Define the term ”Radio Interference (RI)” and explain how we can measure it with a neat block diagram. [8]

4. a) Draw the HVDC transmission system along with various equipment and explain the significance of each. [8]
   b) Explain about different factors that favor HVDC transmission systems over EHVAC transmission for long distances. [8]

5. a) A 3-phase fully controlled bridge converter is connected to a 400 V, 50 Hz supply having a source reactance of 0.3 Ω/ph. The converter is operating as a rectifier at a firing angle of 60°. Estimate the average load voltage and the overlap angle when the converter is supplying a steady current 100 A. [8]
   b) Write the step by step procedure involved in de-energizing an HVDC link. [8]

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6. a) What are the reactive power requirements in steady state? Also write about alternate control strategies in HVDC systems? [8]
   b) Explain the operation of Thyristor Switched Capacitor in case of HVDCT. [8]

7. a) State the various sources of harmonics generation in VSC –HVDC systems and mention the adverse effects caused by these harmonics. [8]
   b) Explain the design procedure for High Pass filters. [8]

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