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

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

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) List the Advantages of EHV AC Transmission? [4]
   b) Explain the properties of bundled conductors. [4]
   c) List the advantages of HVDC transmission. [4]
   d) Explain the Principle of Dc link Control? [4]
   e) What are different sources of reactive power .Explain? [3]
   f) What is the difference between characteristic and non- characteristic harmonics? [3]

PART–B *(3x16 = 48 Marks)*

2. a) Why is EHVAC transmission system required? What are the problems associated in EHVAC system. [8]
   b) A power of 12,000 MW is required to be transmitted over a distance of 1000 Km. At voltage level 750 KV, determine (i) The possible number of circuits required with equal magnitudes for sending and receiving end voltages with 30^{o} phase difference (ii) The current transmitted and (iii) The total lines losses. [8]

3. a) What factors affect the generation of audio noise? Explain the characteristics of audio noise. Derive the expression for the sound pressure level if there are N sources of audio noises. [8]
   b) Explain the different corona loss formulas that are used for evaluation in an EHVAC system. [8]

4. a) List and explain the inherent problems that are associated with HVDC system. [8]
   b) Explain in detail about the constant extinction angle (CEA) control characteristics of the converter. [8]

5. a) Explain the operation of 6 pulse converter with relevant waveforms and hence derive the equivalent circuit [12]
   b) Write a brief note on special features of a converter transformer. [4]

6. a) What are different sources of reactive power? Explain them briefly? [8]
   b) What are the reactive power requirements in steady state? Also write about alternate control strategies in HVDC systems? [8]

7. a) What are the various sources of harmonics generation in a HVDC line? Describe how a single tuned filter can be designed for a HVDC system? [10]
   b) Explain the effect of pulse number on harmonics? [6]