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Code No. : 21704

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**M.E. (EEE: CBCS) I-Semester Main Examinations, January-2018**

(Power Systems & Power Electronics)

**High Voltage D.C. Transmission**

Time: 3 hours

Max. Marks: 60

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

1. Plot a graph between cost Vs distance for HVAC & HVDC. Define break even distance.
2. List advantages of HVDC system.
3. Write different methods of removing harmonics.
4. What are the basic requirement for firing pulse generation of HVDC valves?
5. Draw sketches of transient voltage wave forms at the midpoint and the terminal for inductive and capacitive terminations.
6. Sketch the waveforms of misfire in inverter stations.
7. Explain damping due to torsional interactions.
8. What are the causes for core saturation instability?
9. Discuss voltage limiting control to facilitate the operation of MTDC system where there is no communication system.
10. Discuss different types of parallel MTDC system.

**Part-B (5 × 8 = 40 Marks)**

*(All sub-questions carry equal marks)*

11. a) Compare AC and DC transmission systems.  
b) A six pulse inverter is fed from 800KV DC voltage, find the AC output voltage if advance angle is  $20^\circ$  and extinction angle is  $10^\circ$ .
12. a) Describe equi-distance firing pulse control with neat sketches.  
b) Write six pulse bridge converter characteristics.
13. a) Discuss various converter faults.  
b) Describe working of a DC circuit breaker with neat sketches.
14. a) Explain Torsional interactions with HVDC System and also suggest the various factor affecting the systems.  
b) Explain the mechanical system model using modal-model inertias.
15. a) What are the compact converter stations?  
b) Explain microprocessor based digital control of HVDC station with neat sketches.
16. a) Explain working of smoothing reactors with neat sketches.  
b) Discuss how to design DC side filter
17. Answer any *two* of the following:
  - a) What are the causes for fast transients on DC side system?
  - b) Discuss control of reactive power during transients.
  - c) How to convert existing AC transmission system as HVDC transmission system.

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