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B.Tech.(Electronics & Electrical) (2011 Onwards E-II)

B.Tech.(Electrical & Electronics) (2013 & Onwards E-II) (Sem.-7,8)

HIGH VOLTAGE DIRECT CURRENT TRANSMISSION

Subject Code: BTEEE-804B Paper ID: [A3021]

Time: 3 Hrs. Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

- SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1. Write briefly:

- a. Define the DC breakers.
- b. Why high level controllers used in HVDC system control?
- c. Define the smoothing reactors in DC line.
- d. Write any four advantages of HVDC transmission,
- e. How monopolar operation of DC line occurs?
- f. Write any two objectives of telecommunication requirement in HVDC control system.
- g. Define the thyristor valve.
- h. Define the transient over voltage in DC line.
- i. Define the pulse number in HVDC.
- j. Write any four differences between DC and AC networks.

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SECTION-B

- 2. Explain five limitation of HVDC transmission system.
- 3. Explain the term extinction angle and its significance in inverter control.
- 4. Combining the equivalent of the rectifier and inverter, describe the total equivalent circuit of HVDC link.
- 5. Draw and explain the smoothing reactor AC harmonic filter and DC harmonic filter with an HVDC converter.
- 6. How the modeling of AC network is done? Explain with one example.

SECTION-C

- 7. Sketch and explain the configuration of a 12-pulse bridge converter indicating the connections of two 3-phase transformer.
- A bipolar two terminal HVDC link is delivering 1000 MW at \pm 500 Kv at the receiving 8. end. Total losses in DC circuit are 60 MW. Calculate the following:

 - b) Power in the middle of the line
 c) Sending :
 - c) Sending end voltage
 - d) Total resistance of DC circuit
- Write short notes on 9
 - a) Rod gaps used as protective devices.
 - b) Ground wires for protection of overhead lines.

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