

Roll No.

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Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech.(EE) (2011 Onwards E-III)/
(Electrical & Electronics) (2011 & 2012 Batch E-III)
(Sem.-7,8)**

HIGH VOLTAGE DIRECT CURRENT TRANSMISSION

Subject Code : BTEE-805B

M.Code : 71943

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

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

SECTION-A

1. Write briefly :

- a) Explain the major components of a HVDC transmission in converter station unit.
- b) How the power is reversed in HVDC link?
- c) What are the basic principles of over current protection in HVDC systems?
- d) Discuss in detail the effect of source inductance on the HVDC system.
- e) Define Pulse Number and peak inverse voltage.
- f) Explain briefly about surge arrester and their application.
- g) Define Current Margin.
- h) What are the factors responsible for commutation failure?
- i) What are the effects of proximity of AC and DC transmission lines?
- j) Draw the block diagram of a bipolar link.

SECTION-B

2. Explain twelve pulse converter with schematic diagram and its advantage. Derive an equation for primary current.
3. Discuss the various faults exist in converter station. Explain.
4. What are the different applications of D.C. transmission system? Explain them in detail. With neat sketches explain the different kinds of D.C. links available.
5. Explain harmonics present in the DC voltage and the method to eliminate them.
6. Draw the equivalent circuit of rectifier and an inverter. Derive the equation of power flow across a DC link.

SECTION-C

7. Draw curves of one cycle of instantaneous line to neutral and line to line voltages at the terminals of a Star connected secondary windings of the converter feeding one bridge (6 pulse converter), with $\alpha = 30^\circ$ and $u = 0^\circ$. Develop the expression for DC output voltage as a function of α .
8. Explain the basic means of control in HVDC systems. Draw actual characteristics of the control scheme for a converter and explain the basic philosophy of the three control characteristics.
9. For the interconnection of large power systems what are the technical and economic advantages offered by HVDC? Give a comparison of AC and DC systems on the basis of economics, technical performance and reliability. Explain the modern trends in the field of HVDC technology.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.