Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14EE2027** | **Duration :** | **3hrs** |
| **Sub. Name :** | **HVDC AND FACTS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | State the advantages and disadvantages of DC transmission system with following (i) Economics (ii) Reliability (iii) Performance. | CO1 | 15 |
| b. | List out the problems of AC interconnection. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Draw the converter characteristics of a HVDC link and explain the different modes of operation. | CO1 | 15 |
| b. | List out some of the modern trends in DC transmission. | CO1 | 5 |
|  |  |  |  |  |
| 3. | a. | Draw the schematic diagram of typical HVDC converter station and explain the function of various components available. | CO1 | 15 |
| b. | List out the various applications of HVDC transmission system. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | Give a neat sketch of different HVDC Links. Why the bipolar line is more commonly used? | CO1 | 8 |
| b. | Explain with a single line diagram of a VSC based HVDC Converter station. | CO2 | 12 |
|  |  |  |  |  |
| 5. | a. | Discuss in detail, the HVDC converter control characteristics, negative current margin and modified characteristics including VDCOL. | CO2 | 10 |
| b. | Explain in detail the starting and stopping of a HVDC Link in terms of i) Energisation and De-energisation of a bridge  ii) Start-up of DC Link. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | Explain in detail about the classification of different FACTS controllers. | CO3 | 8 |
| b. | Explain how SVC can be used to enhance the power transfer capacity of a transmission line. | CO3 | 12 |
|  |  |  |  |  |
| 7. |  | Explain the basic principle and different modes of operation in TCSC. | CO3 | 20 |
| (OR) | | | | |
| 8. |  | Compare the following parameters of SVC and STATCOM   1. V -I Characteristics. 2. Transient stability. 3. Capability to exchange real power. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | With neat phasor diagram analyze the conventional transmission capabilities of UPFC. | CO3 | 16 |
| b. | Draw the configuration of UPFC implementation using two ‘back-to-back’ connected voltage sourced converters with a common DC Link. | CO3 | 4 |