

GUJARAT TECHNOLOGICAL UNIVERSITY
BE – SEMESTER – VIII. EXAMINATION – WINTER 2016

Subject Code: 180907

Date: 24/10/2016

Subject Name: Advanced Power Electronics II (Department Elective - II)

Time: 02:30 PM to 05:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

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|-----------|-----|---|----|
| Q.1 | (a) | Define & Explain break even distance for transmission line. For how much distance the HVAC line is preferable to install with & without supporting FACTS devices? | 07 |
| | (b) | Give brief comparison of different SVCS. | 07 |
| Q.2 | (a) | Explain operation of six pulse converter in inversion mode with necessary diagram and waveform. | 07 |
| | (b) | Explain the effect of source inductance on converter output voltage. Also obtain expression of DC output voltage with overlap angle. | 07 |
| OR | | | |
| | (b) | Derive the equation of instantaneous power and define active and reactive power from it. Also draw waveforms of active and reactive power. | 07 |
| Q.3 | (a) | In view of reactive power control, explain working of synchronous condensers with schematic diagram. | 07 |
| | (b) | Draw schematic diagram of HVDC transmission system and explain working of each component in brief. | 07 |
| OR | | | |
| Q.3 | (a) | Draw the diagram of Graetz circuit and also obtain the expression of output voltage. | 07 |
| | (b) | State & discuss the factors to be given due care while designing the Shunt & Series compensators. | 07 |
| Q.4 | (a) | Explain the working of three phase Thyristor Controlled Reactor (TCR) with neat diagrams. How to reduce harmonics introduced by three phase TCR? | 07 |
| | (b) | State advantages of HVDC transmission over EHVAC transmission for bulk power transmission. | 07 |
| OR | | | |
| Q.4 | (a) | Derive equation showing effect of series compensation on power transfer capability of transmission line. State advantages and limitations of series compensation. | 07 |
| | (b) | Explain conventional methods of real power control in the transmission line. | 07 |
| Q.5 | (a) | Write a short note on Emerging transmission networks with relevant diagram. | 07 |
| | (b) | Give comparison between CSC (Classical HVDC) and HVDC-VSC systems. | 07 |
| OR | | | |
| Q.5 | (a) | Explain the hierarchical control scheme for a DC link. | 07 |
| | (b) | Give brief details with sketch of various HVDC links. Also state which link is preferable? | 07 |
