

Duration 3 Hours

Total Marks - 80

NB: - 1) Question No. 1 is Compulsory.

2) Attempt any **three Questions** out of remaining **five Questions**.

3) Assume suitable data if necessary and justify the same.

Q1. Answer **all** questions

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| a) | Explain the merits and demerits of transmission interconnection? | 05 |
| b) | Write a short note on ideal load compensator? | 05 |
| c) | What are the objectives of shunt compensation? | 05 |
| d) | Explain the factors limit the loading capability of transmission line? | 05 |

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| Q2 | a) | Explain in detail with necessary diagrams the basic types of FACTS controller? | 10 |
| | b) | Explain the Thyristor Controlled Reactor (TCR) in detail & condition to obtained Thyristor Switched Reactor (TSR) from TCR. | 10 |

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| Q3 | a) | Derive approximate formula for voltage regulation using short circuit level. | 10 |
| | b) | Explain variable impedance type series compensation (TSSC). | 10 |

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| Q4 | a) | Explain power factor correction in a single phase system | 10 |
| | b) | Explain the Thyristor Controlled Phase Angle Regulator (TCPAR). | 10 |

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| Q5 | a) | Explain switching converter type series compensation (SSSC). | 10 |
| | b) | Explain the midpoint shunt reactor or capacitor var compensator in detail with the help of two machine system. | 10 |

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| Q6 | a) | Explain the shunt compensation by synchronous voltage source | 10 |
| | b) | Explain the basic operating principle of Unified Power Flow Controller (UPFC) with relevant diagram. | 10 |