

University of Mumbai
Examinations Summer 2022

Time: 2 hour 30 minutes

Max. Marks: 80

| Q1. | Choose the correct option for following questions. All the Questions are compulsory and carry equal marks |
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| 1. | Two methods of shunt compensation are - |
| Option A: | resistance and inductance |
| Option B: | capacitance and resistance |
| Option C: | impedance and admittance |
| Option D: | capacitance and inductance |
| 2. | Ideal midpoint shunt compensator maintains a voltage _____ the busbar voltage. |
| Option A: | equal to |
| Option B: | less than |
| Option C: | more than |
| Option D: | double |
| 3. | The maximum applicable voltage and the corresponding current are limited by- |
| Option A: | length of transmission line |
| Option B: | the impedance of TSC module |
| Option C: | the ratings of the TSC components (capacitor and thyristor valve) |
| Option D: | time constant of capacitor |
| 4. | AC to AC switching converters are also known as - |
| Option A: | frequency changers or cyclo-converters |
| Option B: | Synthesizers |
| Option C: | frequency adapters |
| Option D: | The reactive power rating of the compensator greater than Q_{lmax} . |
| 5. | Decreasing E below V (i.e., operating under-excited) results in a _____ current, that is, the machine is seen as a reactor (inductor) by the AC system. |
| Option A: | Lagging |
| Option B: | Leading |
| Option C: | in phase |
| Option D: | 180° apart |
| 6. | List of Static Shunt compensators. |
| Option A: | TCR, TSR, TSSC, TSC |
| Option B: | TSSC, TCSC, SVG, SVS |
| Option C: | SVG, SVC, TCR, TSR |
| Option D: | GCSC, TCSC, TSSC |
| 7. | STATCOM is _____ regulating device. |
| Option A: | Current |
| Option B: | Voltage |
| Option C: | Current and Voltage |
| Option D: | Power factor |
| 8. | The main Objective of series compensation |

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| Option A: | It improve the power factor |
| Option B: | It reduces the fault currents |
| Option C: | Reduce the voltage drop over long distance |
| Option D: | It increases the fault currents |
| 9. | SSSC is a |
| Option A: | Series compensation device |
| Option B: | shunt compensation device |
| Option C: | combined compensator |
| Option D: | loss reduction device |
| 10 | The basic concept of voltage and _____ is the addition of an appropriate in-phase or a quadrature component to the prevailing terminal voltage in order to change its magnitude or angle to the value specified. |
| Option A: | Phase angle regulation |
| Option B: | Phase angle rectification |
| Option C: | Power angle regulation |
| Option D: | Power angle rectification |

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| Q2 (20 Marks) | Solve any Two Questions out of Three | 10 marks each |
| A | Explain TSSC in series compensation with circuit diagram and V-I characteristics. | |
| B | Explain load compensation and the objectives of load compensation. | |
| C | Explain the methods of controllable var generation. | |
| Q3 | Solve any Two Questions out of Three | 10 marks each |
| A | Explain switching converter type series compensation SSSC. | |
| B | Explain thyristor controlled reactor (TCR) in detail and condition to obtain thyristor switched reactor (TSR) from TCR. | |
| C | Explain the objective of Shunt compensation. | |
| Q4 | Solve any Two Questions out of Three | 10 marks each |
| A | Explain thyristor controlled voltage regulator (TCVR) | |
| B | Explain the basic operating principle of UPFC | |
| C | Explain midpoint voltage regulation of line segmentation. | |