

GUJARAT TECHNOLOGICAL UNIVERSITY**BE – SEMESTER- VII EXAMINATION-SUMMER 2023****Subject Code: 3172415****Date: 26/06/2023****Subject Name: Power Electronics for Power System Applications****Time: 10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Explain the power flow control of an AC transmission line. | 03 |
| | (b) Explain the harmonics filter. | 04 |
| | (c) Explain the working principle of STATCOM with neat diagram. | 07 |
| Q.2 | (a) Explain the photovoltaic array. | 03 |
| | (b) Discuss concept of power quality in brief. | 04 |
| | (c) Explain various possible HVDC configurations. | 07 |
| | OR | |
| | (c) Write a brief note on Fixed capacitor TCR. | 07 |
| Q.3 | (a) What is basic concept of shunt compensation? | 03 |
| | (b) Write advantages of FACTS Technology. | 04 |
| | (c) Discuss about HVDC transmission system with appropriate diagram. Also state its advantages. | 07 |
| | OR | |
| Q.3 | (a) Write in brief about IEEE standard for power quality. | 03 |
| | (b) Compare series compensation and shunt compensation in all respect. | 04 |
| | (c) Explain Thyristor controlled reactor (TCR) with necessary diagram. | 07 |
| Q.4 | (a) What is bi-polar link? | 03 |
| | (b) Explain UPFC. | 04 |
| | (c) Write a short note on improved single phase utility interface. | 07 |
| | OR | |
| Q.4 | (a) Explain in brief how power is generated in Wind system? | 03 |
| | (b) Explain IPFC. | 04 |
| | (c) Explain interconnection of Renewable Energy Source utility grid. | 07 |
| Q.5 | (a) Explain the energy storage systems to utility grid. | 03 |
| | (b) Explain in brief concept of directional over current relay. | 04 |
| | (c) Explain the Static differential relay. | 07 |
| | OR | |
| Q.5 | (a) Explain the interface for a bidirectional power flow. | 03 |
| | (b) Explain in brief, how small hydro station works? | 04 |
| | (c) Explain the Static distance relay. | 07 |
