

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (NEW) EXAMINATION – SUMMER 2024****Subject Code: 3152407****Date: 18-05-2024****Subject Name: Power Electronics Circuits - I****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.
4. Simple and non-programmable scientific calculators are allowed
5. Notations used have usual meaning.

MARKS

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|------------|--|-----------|
| Q.1 | (a) Explain term: Uncontrolled Rectifier. | 03 |
| | (b) What is Phase angle Control? Explain. | 04 |
| | (c) Explain the working of single phase uncontrolled rectifier with Resistive load with appropriate waveform. | 07 |
| | | |
| Q.2 | (a) What is need of freewheeling diode? Explain. | 03 |
| | (b) Compare single phase Half wave uncontrolled rectifier with single phase Full wave uncontrolled rectifier in all respect. | 04 |
| | (c) Explain working of single phase full wave bridge controlled rectifier with necessary waveforms. | 07 |
| OR | | |
| | (c) Explain working principle of Dual converter with neat diagram. | 07 |
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| Q.3 | (a) What is function of step down chopper? Explain. | 03 |
| | (b) Explain Time ratio control in brief. | 04 |
| | (c) Explain working principle of second quadrant chopper (type B) Chopper circuit. | 07 |
| OR | | |
| Q.3 | (a) What is effect of source inductance on Converter operation? Explain. | 03 |
| | (b) Explain principle of Current limit control (CLC) in Chopper. | 04 |
| | (c) Discuss about working of Jones Chopper circuit with neat diagram | 07 |
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| Q.4 | (a) Explain term: Continuous conduction mode (CCM) for DC-DC converter. | 03 |
| | (b) What is function of Buck-boost converter? | 04 |
| | (c) Explain working principle of Boost type DC-DC converter with appropriate waveform. | 07 |
| OR | | |
| Q.4 | (a) Explain importance of isolation in DC-DC Power electronics converter circuit. | 03 |
| | (b) What is importance of DC power supply? Explain. | 04 |
| | (c) Explain working of full bridge type DC-DC converter circuit. | 07 |
| | | |
| Q.5 | (a) Explain term: Series Resonance | 03 |
| | (b) Draw only the power circuit diagram and output voltage waveform of three phase half wave uncontrolled rectifier with R load. | 04 |
| | (c) Explain working principle of Cuk converter with neat diagram. | 07 |
| OR | | |
| Q.5 | (a) What are the advantages of Resonant converter? | 03 |
| | (b) What is basic principle of Zero voltage switch (ZVS)? Explain. | 04 |
| | (c) Explain working of Push pull type DC-DC converter circuit. | 07 |
