

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII EXAMINATION – WINTER 2025

Subject Code:3172413

Date:26-11-2025

Subject Name:Advanced Power Electronics Devices and Interface Circuits

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.

- Q.1** (a) Explain the concept of WBG. **03**
(b) What are the properties of WBG semiconductors? Enlist the application areas of WBG. **04**
(c) Explain isolated TRIAC driver IC in detail. **07**
- Q.2** (a) Explain in brief the use of logic analyzer. **03**
(b) Write short note on Current Transformer. **04**
(c) Compare WBG (SiC or GaN) with Silicon based power electronic devices. **07**
- OR**
- (c) Compare SiC devices with Si devices in tabular form. **07**
- Q.3** (a) What do you mean by Galvanic Isolation? Enumerate its importance. **03**
(b) Discuss single switch driver with SC protection **04**
(c) Explain Half bridge driver IC without SC protection. **07**
- OR**
- Q.3** (a) Discuss thermal resistance. **03**
(b) What is the reason of keeping air-gap in high frequency inductors. **04**
(c) Explain the differential Voltage Probe & Current Probe. **07**
- Q.4** (a) Explain Isolation Amplifier. **03**
(b) Explain single switch driver IC without SC protection. **04**
(c) Draw and explain Analog to Digital converter circuit. **07**
- OR**
- Q.4** (a) Draw block diagram of CRO. **03**
(b) Discuss floating ground in power converters. **04**
(c) Discuss steps of heat sink design and calculation for SCR. **07**
- Q.5** (a) Explain F to V converter. **03**
(b) Discuss Hall effect current sensors. **04**
(c) Explain voltage measurement using discrete components. **07**
- OR**
- Q.5** (a) Explain Linear Opto-coupler. **03**
(b) Discuss Voltage Measurement using LEM LV 25-P. **04**
(c) Write short note on use of Power Scope for power electronics applications. **07**
