

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2018****Subject Code: 2172408****Date: 26/11/2018****Subject Name: Advanced Power Electronics Devices & 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.

- Q.1** (a) Why do semiconductors have a band gap? **03**  
 (b) State various wide band gap materials and their energy band gap. **04**  
 (c) Compare WBG (Sic or GaN) with Silicon based power electronics **07**
- Q.2** (a) Discuss need of MOSFET driver? **03**  
 (b) Enlist isolated and non-isolated driver ICs. **04**  
 (c) Draw functional diagram of ULN2803 IC. State advantages of this IC over relay driver using discrete components. **07**
- OR**
- (c) Discuss use of MOC3020 to control speed of fan. **07**
- Q.3** (a) Write short note on Current Transformer. **03**  
 (b) Discuss Gate Drive Requirements Of High-Side Devices. **04**  
 (c) Discuss F to V Converter. **07**
- OR**
- Q.3** (a) State working principle of Frequency & Speed Measurement. **03**  
 (b) Explain application of Linear Opto-coupler. **04**  
 (c) Compare Logic Analyzer with DSO. **07**
- Q.4** (a) Explain requirement of Isolation Amplifier. **03**  
 (b) Write short note on Measuring and Interfacing Analog Signals. **04**  
 (c) Explain the measurement & interfacing of analog signals with Digital System. **07**
- OR**
- Q.4** (a) Draw Analog to Digital converter circuit. **03**  
 (b) Multichannel Power Supplies vs. Single Channel Power Supplies: Is More Necessarily Better? **04**  
 (c) Explain Voltage Measurement using Discrete Components. **07**
- Q.5** (a) Draw schematic diagram of CRO. **03**  
 (b) Compare CRO with DSO. **04**  
 (c) Explain how a TTL IC can be interfaced with CMOS IC. Draw interconnection diagrams also. **07**
- OR**
- Q.5** (a) Draw block diagram of CRO. **03**  
 (b) Write short note on Grounding for Power Circuits. **04**  
 (c) Write short note on use of Power Scope for power electronics applications. **07**

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