

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech Degree S8 (R,S) Exam April 2025 (2019 Scheme)

**Course Code: EET456****Course Name: DESIGN OF POWER ELECTRONIC SYSTEMS****Max. Marks: 100****Duration: 3 Hours****PART A***Answer all questions, each carries 3 marks.*

Marks

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|----|--|-----|
| 1  | Explain the need isolated gate drive circuits. Name any two approaches for gate drive isolation. | (3) |
| 2  | What are the requirements of a good gate driver ?  | (3) |
| 3  | Explain the functions of a snubber circuit.  | (3) |
| 4  | How do we select a heat sink for a power electronics device ?                                    | (3) |
| 5  | Design an output filter for a single phase inverter.   | (3) |
| 6  | How do we select a capacitor for a power electronic circuit ?                                    | (3) |
| 7  | Explain the Area Product method of selection of magnetic materials for inductors.                | (3) |
| 8  | How do we select wire for an inductor ?  | (3) |
| 9  | Explain the basics of an Intelligent Power Module  | (3) |
| 10 | What are the methods of sensing current in a power electronic circuit?                           | (3) |

**PART B***Answer any one full question from each module, each carries 14 marks.***Module I**

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| 11 | Using IC IR2110, design a gate drive circuit for a full bridge inverter. | (14) |
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**OR**

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| 12 | Explain at least four gate drive circuits for a MOSFET | (14) |
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**Module II**

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|----|---|------|
| 13 | Design a turn-on and turn-off snubber circuit for a power electronic converter. | (14) |
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**OR**

- 14 Explain in detail the designing of Thermal protection in power electronic circuits (14)

**Module III**

- 15 a) Explain the effect of equivalent series resistance and inductance of capacitor in power electronic converters (7)  
b) Describe various types of power resistors used in power electronic circuits (7)

**OR**

- 16 a) Explain the different types of transformers available for a power electronic circuit. (7)  
b) Explain the different types of capacitors available for a power electronic circuit ? (7)

**Module IV**

- 17 a) Describe Amorphous, Ferrite and Iron cores used in power electronic circuits (7)  
b) Design a transformer for forward converter. (7)

**OR**

- 18 a) Explain the thermal considerations in power electronic circuits (7)  
b) What are the factors affecting the hysteresis loss in a core ? (7)

**Module V**

- 19 a) Design a current transformer for power electronic applications (7)  
b) Explain signal conditioning circuits, level shifters and anti-aliasing filters for a power electronic circuit. (7)

**OR**

- 20 a) Design a Hall effect sensor for current sensing in power electronic circuits (7)  
b) What are the effects of stray inductance in bus bar? How do we reduce this ? (7)

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