

(3 Hours)

[Total Marks: 80]

- N. B.:** (1) Question No. 1 is compulsory.
(2) Attempt any three questions from remaining five questions.
(3) Assume suitable data if necessary.
(4) Figures to the right indicate full marks.

1. Attempt **any four** questions:

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- (a) Draw Gate driver circuits for power MOSFET and Power Transistor.
(b) Justify the need for multilevel inverters.
(c) Explain the challenges in computer simulation.
(d) Give advantages of parallel operation of inverters.
(e) Give advantages and applications of static switches.

2. (a) Explain SOA ratings for power transistors in detail.

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(b) Explain Clarke transform and list its applications.

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3. (a) Draw diagram of second-order hold (SOH) for DC-DC converters in digital control.

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(b) Explain different inverter topologies with the help of diagrams.

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4. (a) With the help of neat circuit diagram explain the principle of operation of diode clamped multilevel inverter.

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(b) Differentiate between IGBT and SCR. Explain the suitability of each from application view point.

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[TURN OVER]

5. (a) Explain in detail the single-phase full wave AC voltage controller with inductive load. 10

(b) Explain various simulation platforms for power electronic systems. 10

6. Write short notes on **(any three)** 20

- (a) PID control of DC-DC converters.
- (b) Smart grid and micro grid.
- (c) Space vector modulation technique.
- (d) Induction motor drive.
- (e) Distributed generation system.
