

Seat  
No.

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DEI1345

**Power Electronics - I**  
**(New) (1210)**

**P. Pages : 2**

**Time : Three Hours**

**Max. Marks : 100**

Instructions to Candidates :

1. Do not write anything on question paper except Seat No.
2. Answersheet should be written with blue ink only. Graph or diagram should be drawn with the same pen being used for writing paper or black HB pencil.
3. Students should note, no supplement will be provided.
4. Assume suitable data if necessary.
5. Use of non - programmable calculator is allowed.
6. All questions are compulsory.

**UNIT - I**

1. Attempt **any two** of the following. 20
- a) Explain the construction of FET and JFET in detail.
  - b) Explain the construction of G.T.O. with diagram, also draw & explain turn OFF and turn ON characteristics.
  - c)
    - i) Draw the construction of MOSFET and explain.
    - ii) Explain switching waveforms & voltage breakdown in terms of MOSFET.

**UNIT - II**

2. Attempt **any two** of the following. 20
- a) Explain the single phase full wave converter with neat diagram, also draw the output waveforms and waveforms across SCR.
  - b) Explain the discontinuous current conduction and inverter mode operation for single phase full controlled bridge converter.
  - c) Explain with neat sketch and waveforms,  $3\phi$  full controlled converter with highly inductive load.

**UNIT - III**

3. Attempt **any two** of the following. **20**
- a) Draw and explain the block diagram of the step - up chopper, also explain continuous & discontinuous current conduction.
  - b) Explain full bridge DC - DC converter with bipolar and unipolar PWM.
  - c) Explain with respect to SMPS.
    - i) Power supply protection
    - ii) Soft start
    - iii) Electrical isolation of feed back loop.
    - iv) Digital PWM control.

**UNIT - IV**

4. Attempt **any two** of the following. **20**
- a) Draw the circuit diagram and waveforms of parallel inverter and explain.
  - b) What is PWM switching and square wave switching scheme in terms of inverter.
  - c) Draw the block diagram of UPS and explain in detail.

**UNIT - V**

5. Attempt **any two** of the following. **20**
- a) Explain with neat diagram, zero voltage and zero current switching.
  - b) Classify resonant converters, and explain underdamped series resonant circuit.
  - c) Explain current source parallel resonant dc-ac inverter for induction heating. Give advantages and applications of same.

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