

(3 Hours)

Total Marks: 80

N. B. 1) Question No. 1 is compulsory.

- 2) Attempt any three questions out of the remaining five questions.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data wherever required but justify the same.

Q 1. Attempt any Four: -

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- a) Explain the effect of source inductance on Single phase full controlled bridge rectifier.
- b) State advantages of PWM Method for voltage source inverters.
- c) Explain significance of slip in ac motors with suitable example.
- d) Explain regenerative braking of DC motor
- e) State different factors for selection of battery in UPS systems.

Q 2. a) Explain the speed control of separately excited dc motor by single phase full converter for continuous motor current. Also draw associated voltage and current waveforms. **10**

b) Explain the principle of Induction heating. State advantages, disadvantages and applications. **10**

Q 3. a) Derive and explain the average state space model of boost converter. **10**

b) Explain variable frequency control method of induction motor for two different working modes. **10**

Q 4 a) Explain state vector sequence and switching used in SVM. State advantages of SVM **10**

b) Derive an expression for average output voltage of a three phase full converter with R load by considering the effect of source inductance. **10**

Q 5 a) Explain the isolated fly back converter in continuous mode. State advantages and disadvantages. **10**

b) Explain rotor resistance control Scheme using chopper in detail. **10**

Q 6. Write Short Notes on-[Any Four]

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- i) PID control in dc to dc converter
- ii) Torque speed characteristic of IM
- iii) Soft start soft stop operation of dc motor
- iv) SMPS and UPS
- v) Harmonic reduction techniques.