

Roll No.

Total Pages : 2

BT-6/M-20

36025

POWER ELECTRONICS-II

Paper-EE 308E

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt *five* questions in all, selecting at least *one* question from each unit.

UNIT-I

1. (a) Describe the principle of dc chopper operation. Derive an expression for its average dc output voltage. 8
(b) Explain steady state analysis of class A choppers in detail. 12
2. Explain working of current commutated chopper. Draw and explain necessary current and voltage waveforms for this chopper. 20

UNIT-II

3. (a) What is an Inverter ? List a few industrial applications of inverters. 5
(b) Describe modified McMurray-Bedford half-bridge single-phase Inverter with relevant voltage and current waveforms. The working of this inverter may be explained in certain well-defined modes. 15
4. Describe the principle of working of a three-phase bridge inverter with an appropriate circuit diagram. Draw phase and

line voltage waveforms on the assumption that each thyristor conducts for 180° and the resistive load is star-connected. The sequence of firing of various SCRs should also be indicated in the diagram. 20

UNIT-III

5. Describe the working of a single-phase series inverter with appropriate circuit and waveforms. For this inverter, derive an expression for the output frequency in terms of circuit parameters and T_{off} . 20
6. Describe a single-phase capacitor-commutated CSI connected to load R with the help of its power circuit diagram and waveforms for gating signals, load current, capacitor voltage and current, input voltage and voltage across one thyristor. Find an expression for load current. 20

UNIT-IV

7. (a) What is SMPS ? Give its operating principle and industrial applications. 8
- (b) Explain Block diagram of D.C. motor speed control. 12
8. (a) What are ac drives ? Give the merits and demerits of ac drives with respect to dc drives. 6
- (b) Describe a static Kramer drive system. Find an expression of slip 's' at which it operates. 14
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