Total No. of Questions : 8] *[Total No. of Printed Pages : 4*

Roll No .....

EE/EX-502-CBGS

B.Tech., V Semester

Examination, December 2020

Choice Based Grading System (CBGS)

Power Electronics

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.

ii) All questions carry equal marks.

iii) In case of any doubt or dispute the English version question should be treated as final.

1. a) What are the different methods to turn on the Thyristor? 7

   Thyristor

   b) Describe LASCR. Give its industrial applications. Draw circuit diagram and waveform of time delay relay using SCR and UJT for AC load. 7

2. a) Explain the two transistor analogy of SCR with equivalent circuit and give three applications. 7

   b) Draw V-I characteristics of DIAC, is DIAC equally sensitive in both the directions? Give two application of DIAC. 7

3. a) Compare power BJT, power MOSFET and IGBT (any four points). 7

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   b) Draw the single phase full wave bridge type controlled rectifier. Draw the waveforms of input voltage, load voltage and voltage across . 7

4. a) Explain the working principle of multiphase chopper.7

   b) Draw the labelled layer diagram of N-channel IGBT. Draw its VI characteristics. 7

5. a) Differentiate between single phase controlled half wave rectifier and single phase controlled full wave rectifier. 7

b) State any two features of power MOSFET which makes it suitable for medium power applications. 7

6. a) Is there any Single-Phase to Three-Phase Cycloconverter existing? How does it operate? 7

b) What is meant by Cyclo-converter? What are the types of Cyclo-converters? 7

Cyclo-
³¶m h¢?

7. a) What is the principle of chopper? What is the function of inverter, chopper in SMPS? 7

b) A step-down delta-star transformer, with per-phase turns ratio of 5 is fed from a 3-phase 1100V, 50Hz source. The secondary of this transformer is connected through a 3-pulse type rectifier, which is feeding an R load. Find the average value of output voltage. 7

5 H$m

8. a) A 3-phase bridge rectifier has the average output voltage as 286.48 V. Find the maximum value of line voltage 7

b) Find the triggering frequency when the average gate power dissipation = 0.3W and the peak gate drive power is 5 Watts. The gate source has a pulse width of 20 μsec duration. 7

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