CBCS SCHEME

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21MT641

Sixth Semester B.E./B.Tech. Degree Examination, June/July 2025
Power Electronics

Time: 3 hrs. Max. Marks: 100

Note: *Answer any FIVE full questions, choosing ONE full question from each module.*

Module-1

1 a. Illustrate the peripheral effects of power electronic equipments. **(07 Marks)**

b. Using neat diagram, explain diode rectifier circuit. **(07 Marks)**

c. Describe static switches. **(06 Marks)**

OR

2 a. Illustrate the relationship of power electronics and control. **(06 Marks)**

b. Classify the power electronic circuits and explain DC to AC inverter circuit. **(07 Marks)**

c. With neat block diagram, explain typical power electronic convertor. **(07 Marks)**

Module-2

3 a. Using cross section of PNPN, and split section at NPN and PNP describe thyristors. **(07 Marks)**

b. Explain di/dt and dv/dt protection in thyristors. **(07 Marks)**

c. Discuss gate turn off thyristors. **(06 Marks)**

OR

4 a. Using neat diagram, explain V-I characteristic of thyristors. **(07 Marks)**

b. Discuss two transistor model of thyristor. **(05 Marks)**

c. Compare Natural and forced commutation technique and explain self or load commutation technique. **(08 Marks)**

Module-3

5 a. Write a brief note on AC voltage controller and explain two different types of power transistor control. **(06 Marks)**

b. Illustrate the single phase full wave controller with resistive load. **(07 Marks)**

c. Describe single phase full converter. **(07 Marks)**

OR

6 a. What are controlled rectifiers and explain with example two different types of phase control converters. **(06 Marks)**

b. Write note on semi, full and dual converters. **(06 Marks)**

c. Using neat diagram, explain single phase full move controller with R-L-load. **(08 Marks)**

Module-4

7 a. Explain the performance parameters of DC + DC converters. **(06 Marks)**

b. Illustrate the step down chopper circuit using resistive load. **(07 Marks)**

c. Discus class-B chopper or second quadrant converter. **(07 Marks)**

OR

8 a. Write a brief note on converter classification along with the diagram. **(07 Marks)**

b. Explain step-up chopper circuit. **(07 Marks)**

c. Describe different methods at control in the operation of chopper circuit. **(06 Marks)**

Module-5

9 a. Illustrate the principle operation of an inverter. **(08 Marks)**

b. Write a note on :
   i) Harmonic Factor n^{th} harmonic (HFu)
   ii) Total Harmonic Distortion
   iii) Distortion Factor **(12 Marks)**

OR

10 a. Using neat diagram, explain single phase full bridge inverter. **(10 Marks)**

b. Write a note on : Single pulse width modulation. **(10 Marks)**

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