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Sub Code:NEE502

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**B TECH**

**(SEM 5) THEORY EXAMINATION 2017-18**

**POWER ELECTRONICS**

*Time: 3 Hours*

*Total Marks: 100*

- Note:** (i) Attempt all questions. If required any missing data; then choose suitably.  
(ii) All questions carry equal marks.

**SECTION -A**

1. Attempt all question in brief. **(2x10=20)**
- a) Draw transfer characteristic of MOSFET.
  - b) What are the advantage and disadvantage of on-off control?
  - c) What are the advantage and disadvantage of phase angle control?
  - d) What is a cycloconverter?
  - e) What are the advantage and disadvantage of cycloconverter?
  - f) What is meant by step-up and step-down chopper?
  - g) What are the advantages of GTO over SCR?
  - h) What do you mean by holding current and latching current?
  - i) What are the applications of dc chopper?
  - j) What are the advantages of single phase bridge converter over single phase mid-point converter?

**SECTION -B**

2. Attempt any **three** parts of the following **(10x3=30)**
- a) Draw the two transistor model of SCR and derive an expression for anode current.
  - b) Write the applications of power electronics devices.
  - c) What is the need of protective device in power electronics devices? Explain the snubber circuit with the help of circuit diagram?
  - d) Explain the construction and working principle of SCR. Also draw the V-I characteristics of SCR.
  - e) Explain the working principle of single phase to single phase cycloconverter with appropriate Waveform and bridge circuit?

## SECTION -C

3. Attempt any **one** part of the following **(10x1 =10)**
- a) Describe the principle of step-up chopper. Derive an expression for the average output voltage in terms of input dc voltage & duty cycle.
  - b) Draw and explain output characteristic of power MOSFET.
4. Attempt any **one** part of the following **(10x1 =10)**
- a) A step up chopper has input voltage 220 V and output voltage 660 V. If off time of chopper is 100 micro second, find chopping frequency.
  - b) What does ac voltage controller mean? What are the applications of ac voltage controllers?
5. Attempt any **one** part of the following **(10x1 =10)**
- a) Explain working of TRIAC.
  - b) Explain working of GTO.
6. Attempt any **one** part of the following **(10x1 =10)**
- a) Explain single phase transformer connection changer. Draw waveform for input and output voltage.
  - b) Explain single phase to single phase cycloconverter and draw circuit and waveform for resistive load.
7. Attempt any **one** part of the following **(10x1 =10)**
- a) Explain three phase to single phase cycloconverter with neat diagram
  - b) Explain operation of three phase bridge inverter..