



**JX-003-497005**

Seat No. \_\_\_\_\_

**B. Sc. / M. Sc. (Applied Physics) (Sem. VII) (CBCS)  
Examination**

**October - 2019**

**Paper - III : Semiconductor Devices & Applications  
(New Course)**

**Faculty Code : 003**

**Subject Code : 497005**

Time :  $2\frac{1}{2}$  Hours]

[Total Marks : 70

- Instructions :** (1) All questions are compulsory.  
(2) Figures to the right side indicate marks.

- 1 Attempt any **seven** short questions : (two marks each) **14**
- (1) What is the delay angle control of converters ?
  - (2) What is meant by switches in power electronics ?
  - (3) Why Control is very important parameter of power devices ?
  - (4) Differentiate normal PN diode to Power diode.
  - (5) What is power electronics ?
  - (6) What is meant by commutation circuit ?
  - (7) What is the time constant of RL circuit ?
  - (8) What is the time constant of RC circuit ?
  - (9) What is a converter ?
  - (10) Why should the available reverse bias time be greater than the turn off time of the Thyristor ?
- 2 Write answers of any **two** : **14**
- (1) Explain in detail : Diode with RC load.
  - (2) Explain in detail : Diode with RL load.
  - (3) Explain Freewheeling diodes.
  - (4) Discuss Single phase half wave rectifier.

- 3** Write answers of any **two** : **14**
- (1) What is the relationship of power electronics to power, electronics and control ?
  - (2) Differentiate different power semiconductor devices on the basis of voltage/current ratings.
  - (3) List different types of power semiconductor switching devices on the basis of their control characteristics
  - (4) Discuss in brief - The power Electronics Circuit's classification.
- 4** Write answers of any **two** : **14**
- (1) Discuss with diagram Single phase full wave rectifier.
  - (2) What is meant by Chopper circuit in power electronics ?
  - (3) Discuss types of Power transistors.
  - (4) What is reverse recovery time ? Why it is needed to be taken into account for power devices ?
- 5** Write answers of any **two** : **14**
- (1) Explain Diode with RLC load.
  - (2) List different types of commutation circuits for thyristors. Explain any one in detail.
  - (3) What is Multiphase rectifiers? Explain its basic features.
  - (4) Define and discuss with respect to rectifiers: efficiency of a rectifier, form factor, rippal factor, transformer utilization factor.
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