



PBD-003-1273004 Seat No. _____

M. Sc. (ECI) (Sem. III) (CBCS) Examination

November / December - 2018

Power Electronics : Paper - 11

(New Course)

Faculty Code : 003

Subject Code : 1273004

Time : **2.30** Hours]

[Total Marks : **70**

- Instructions :** (1) All questions carry equal marks.
(2) Figures on right hand side indicate marks.

1 Answer the following : **14**

- (1) Class F-commutation also is known as _____.
(Natural, Forced)
- (2) BJT is also called _____ device. (Voltage, Current)
- (3) SCR is a _____ device. (Unidirectional, Bidirectional)
- (4) To improve the wave shape of load current and power factor, a diode is known as _____.
(PIN diode, Freewheeling diode)
- (5) Chopper is also called _____ converter.
(ac-ac, dc-dc)
- (6) Rectifier circuits using thyristors are known as _____.
(Uncontrolled, Controlled)
- (7) A semi-converter is a _____ quadrant converter.
(Two, One)
- (8) The conversion of dc to ac is known as _____.
(Rectification, Inversion)
- (9) In high power devices, rectifier circuits use diode.
(T/F)
- (10) In a series inverter, the elements R, L, C must form an underdamped circuit. (T/F)
- (11) Chopper is a high efficient circuit. (T/F)
- (12) In AC Regulator integral cycle control, the rms value of output voltage is proportional to duty cycle. (T/F)
- (13) A cycloconverter converts as at one frequency to ac at another frequency. (T/F)
- (14) Draw the symbol of IGBT.

- 2** Answer the following : (Any **Two**)
- (1) What is a thyristor? Describe the holding current and latching current as applicable to an SCR with the help of its static V-I characteristic. **7**
 - (2) Explain the two transistor analogy of an SCR with the help of a neat diagram. **7**
 - (3) Explain the triggering methods of thyristors in series. **7**
- 3** Answer the following :
- (1) What are the different classes of forced commutation method? Draw circuits and explain class C commutation of thyristors. **5**
 - (2) Discuss the UJT as a relaxation oscillator with circuit diagram and wave forms. **5**
 - (3) Explain the difference between a Transistor and SCR. **4**
- OR**
- 3** Answer the following :
- (1) Draw the V-I characteristics of a TRIAC and explain its working principle. **5**
 - (2) Give names of triggering circuits for a thyristor. Draw and explain any one triggering circuits for a thyristor. **5**
 - (3) Give comparisons of Power MOSFET and IGBT. **4**
- 4** Answer the following : (Any **Two**)
- (1) What is a GTO? Discuss its operation. **7**
 - (2) Why is it necessary to connect thyristors in series? Draw static and dynamic equalizing circuits for thyristors in series and explain their operation. **7**
 - (3) What is a unijunction transistor? Explain its configuration and characteristics. **7**
- 5** Answer the following : (Any **Two**)
- (1) Explain the working of a single phase fully controlled bridge converter supplying purely resistive load with wave shapes. **7**
 - (2) What is Inverter? Draw the diagram of a parallel inverter and discuss its modes of operation. **7**
 - (3) Give the classification of choppers. Show the quadrants of different choppers. **7**
 - (4) What do you mean by cycloconverter? Explain the principle of cycloconverter using a simple diagram. **7**