No. of Printed Pages : 4

BIELE-005

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI)

Term-End Examination

00563

December, 2016

BIELE-005 : INDUSTRIAL ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Answer **five** questions including question no. **1** which is **compulsory**. Missing data may be suitably assumed. Use of scientific calculator is permitted.*

1. Choose the correct answer. *7×2=14*

(a) SCR is a

(i) 5-layer 3-junction device

(ii) 2-layer 1-junction device

(iii) 4-layer 3-junction device

(iv) 4-layer 2-junction device

(b) Power transistors are types of

(i) BJTs

(ii) MOSFETs

(iii) IGBTs

(iv) All of the above

(c) A GTO can be turned ON by applying

(i) Positive gate signal

(ii) Positive drain signal

(iii) Positive source signal

(iv) None of these

(d) IGBT combines the advantages of

(i) BJTs and SITs

(ii) BJTs and MOSFETs

(iii) SITs and MOSFETs

(iv) None of these

(e) Which semiconductor device acts like a diode and two transistors ?

(i) UJT

(ii) DIAC

(iii) TRIAC

(iv) SCR

(f) A TRIAC is effectively

(i) antiparallel connection of two thyristors

(ii) antiparallel connection of a thyristor and a diode

(iii) antiparallel connection of two diodes

(iv) two thyristors, in parallel, to increase the current capacity of the device

(g) Which of the following does ***not*** cause permanent damage to SCR ?

(i) High current

(ii) High rate rise of current

(iii) High temperature rise

(iv) High rate rise of voltage

2. (a) Explain the concept of Holding and Latching current in a thyristor. *7*

(b) Draw and explain gate triggering circuit of a thyristor. *7*

3. Explain the working of a single-phase full wave controlled rectifier circuit with resistive load. Draw the waveform of input-output voltages and currents. *14*

4. Explain the construction of UJT with its advantages and applications. Draw the V – I characteristics with a neat sketch and discuss the region of importance. *14*

5. What is commutation process ? Explain the class 'C' scheme to turn off a thyristor with a suitable circuit diagram. *14*

6. With a neat sketch diagram, explain the working principle of a three-phase half wave Delta-Wye rectifier. Show the input and output voltage waveforms. *14*

7. Write short notes on any ***two*** of the following : *2×7=14*

   (a) IGBT

   (b) Synchronized UJT Triggering

   (c) MOS Controlled Thyristor