

**DIPLOMA - VIEP - ELECTRONICS AND
COMMUNICATION ENGINEERING (DECVI)**

00959 Term-End Examination

December, 2017

BIELE-005 : INDUSTRIAL ELECTRONICS

Time : 2 hours

Maximum Marks : 70

Note : Attempt five questions in all. Question no. 1 is compulsory. All questions carry equal marks. Missing data, if any, may be suitably assumed. Use of scientific calculator is permitted.

1. Write *True/False* for the following : $7 \times 2 = 14$
- (a) BJT is a voltage-controlled device.
 - (b) SCR is a bidirectional device.
 - (c) UJT can be used as a relaxation oscillator.
 - (d) Output of a phase-controlled rectifier is AC.
 - (e) Commutation means turning off the thyristor.

- (f) DIAC is a three-terminal device.
- (g) Two thyristors of same rating and same specifications may have equal or unequal turn-on and turn-off periods.
2. (a) Discuss the structure and I – V characteristics of power transistors. 7
- (b) Explain the operation of a UJT with the help of its structure. 7
3. Explain in detail, the various “Turn-on” methods of a thyristor. 14
4. Explain the operation of a Class-C complementary commutation circuit (i.e., switching a charged capacitor by a load carrying SCR). 14
5. (a) Explain the operation of a three-phase Delta-Wye Bridge rectifier circuit with the help of a neatly labelled circuit diagram. 10
- (b) Explain the effect of a freewheeling diode. 4
6. With the help of a neatly labelled circuit diagram and input-output waveforms, explain the working of a single-phase full-wave controlled rectifier (mid-point converter) circuit with resistive load. 14

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

- (a) Insulated Gate Bipolar Transistor (IGBT)
 - (b) Effect of Freewheeling Diode
 - (c) LASCR
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