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BIELE-005

DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)

01241

Term-End Examination

December, 2013

BIELE-005 : INDUSTRIAL ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **any five** questions in all. Question No.**1** is **compulsory**. All questions carry **equal** marks.*

1. Multiple choice : **7x2=14**

(a) The latching current is :

(i) equal to the holding current

(ii) greater than the holding current

(iii) less than the holding current

(iv) not related to the holding current

(b) The forward break over voltage of normal SCRs is :

(i) Below 100V

(ii) Between 100 to 200V

(iii) 400V or above

(iv) Any voltage

(c) The PUT is :

(i) not a thyristor

(ii) like the UJT

(iii) not a four layer device

(iv) triggered ON and OFF by the gate to anode voltage

(d) A thyristor can be protected against high di/dt by :

(i) a small inductor in series

(ii) a large inductor in series

(iii) a capacitor in parallel

(iv) an RC circuit in parallel

(e) An UJT relaxation oscillator :

(i) can be used for firing a single thyristor only.

(ii) frequency cannot be varied.

(iii) frequency is independent of the intrinsic stand off ratio.

(iv) can be suitably used for firing more than one thyristor.

(f) The ripple voltage of a polyphase rectifier :

(i) increases

(ii) decreases

(iii) remains unaltered as the number of phases increases

(iv) none of these

(g) In a single phase half wave rectifier circuit with inductive load, the conduction period of the diode is :

(i) 180°

(ii) less than 180°

(iii) lies between 180° and 360°

(iv) none of these

2. (a) Draw the V-I characteristics of power transistor (output characteristic of NPN type) and also explain it. 7

(b) What do you mean by Safe Operating Area (SOA) ? List its significance. 7

3. (a) Draw the V-I characteristics of TRIAC and also give its various applications. 7

(b) Explain the working of UJT as relaxation oscillator. 7

4. (a) Describe various thyristor turn-off methods. 7

(b) Differentiate between resistance firing circuit and resistance capacitance firing circuit. 7

5. Draw the circuit diagram and waveforms of three phase half wave Delta-Wye rectifier and also compare it with six phase star half wave rectifier. 14

6. Draw the circuit diagram and wave forms of single phase half wave controlled rectifier with R and RL loads and also analyse the circuit. 14

7. Describe fully controlled bridge circuit with inductive load (RL Load) and explain its inverting mode operation. 14

8. Write short notes on **(any four)** : $3\frac{1}{2} \times 4 = 14$

(a) IGBT
(b) DIAC
(c) PUT
(d) SCS
(e) Effect of free wheeling diode
(f) Mid point converter