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BIEE-030

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DIPLOMA IN ELECTRICAL ENGINEERING (DELVI)/ADVANCED LEVEL CERTIFICATE COURSE IN ELECTRICAL ENGINEERING (ACELVI)

Term-End Examination

June, 2013

BIEE-030 : INDUSTRIAL DRIVES AND CONTROLS

Time : 2 hours *Maximum Marks : 70*

Note : *(i) Attempt **any five** questions.*
*(ii) Question No. **1** is **compulsory**. (objective type)*
(iii) Draw neat and clean diagram, if any, required.

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1. (a) In a thyristor, the holding current I_H is : **7x2=14**

(i) more than the Catching current I_L

(ii) less than I_L

(iii) equal to I_L

(iv) equal to zero

(b) A triac is a :

(i) 2 terminal switch

(ii) 2 terminal bilateral switch

(iii) 3 terminal unilateral switch

(iv) 3 terminal bidirection switch

(c) A four quadrant chopper cannot be operated as :

(i) One quadrant chopper

(ii) Cycloconverter

(iii) Inverter

(iv) bi - directional rectifier

(d) The most suitable device for high frequency inversion in SMPS is :

(i) BJT (ii) IGBT

(iii) MOSFET (iv) GTO

(e) The most suitable solid state converter for controlling the speed of the three - phase cage motor at 25 Hz is :

(i) Cycloconverter

(ii) CSI

(iii) VSI

(iv) Load Commutated Converter

(f) In a thyristor controlled rectifier the Firing angle of thyristor is to be controlled in the range of :

(i) 0 to 90° (ii) 0 to 180°

(iii) 90 to 180° (iv) 90 to 270°

(g) In case of VSI, FD can be avoided for the load of :

(i) Inductive nature

(ii) Capacitive nature

(iii) Resistive nature

(iv) Back emf nature

2. (a) Explain with neat waveform for speed control of dc motor using single phase fully controlled rectifier. 7

(b) Draw speed - torque characteristics of dc shunt motor and derive relation between fixing angle and speed. 7

3. (a) Explain single phase half wave and semiconverter drive for dc series motor control. 7

(b) Draw the waveform of output voltage and current for single phase semi - converter connected with separately excited dc motor. 7

4. (a) Explain difference between single phase and three phase fully controlled drive connected to dc shunt motor with neat waveform. 7

(b) Draw the output voltage and current waveform of 3 phase semi-converter drive. 7

5. (a) Explain chopper drive connected to DC motor and derive the relation between duty cycle and speed. 7

(b) Draw continuous and discontinuous waveform of single and four quadrant chopper drive. 7

6. (a) What are draw backs of SCR over TCR, also explain advantage of thyristor power converters. 7

(b) What do you understand by the dv/dt rating of a thyristor ? 7

7. (a) Explain PWM control in detail : 7

(b) Explain v/f control of induction motor. 7

8. (a) Compare VSI and CSI. 7

(b) Explain with waveform cycloconverter drive. 7