# 314363

**12526**

**3 Hours / 70 Marks** Seat No. | | | | | | | | |

*Instructions* – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

**1. Attempt any FIVE of the following :** **10**

a) Draw labelled symbol of LASCR and TRIAC.

b) State the relation between firing angle and conduction angle with waveform.

c) Write four turn ON methods of SCR.

d) Draw the basic block diagram of SMPS.

e) List two applications of inverter.

f) Define latching current and holding current of SCR.

g) A single phase full wave controlled rectifier is supplied with a voltage V = 230 sin 314 t. If firing angle is 30 degrees, find average dc output voltage.

P.T.O.

**Marks**

**2. Attempt any THREE of the following :** **12**

a) Explain the working of class C commutation with neat circuit diagram and waveforms.

b) Draw and explain proximity detector using SCR.

c) Interpret the VI characteristics of PUT.

d) Draw the circuit diagram of a semi-converter with R load and explain its working.

**3. Attempt any THREE of the following :** **12**

a) Draw VI characteristics of SCR. State the effect of gate current on operation of SCR.

b) Give classification of cyclo-converter. State and explain working principle of single phase cyclo-converter with R load.

c) Explain the effect of freewheeling diode with respect to single phase centre tapped full wave controlled rectifier with RL load.

d) Define performance parameters for the inverter.

**4. Attempt any THREE of the following :** **12**

a) Draw the constructional diagram of GTO and explain it's working.

b) Explain with circuit diagram the operation of battery charger using SCR.

c) Explain operation with circuit diagram a suitable type of triggering circuit to control the firing angle from 0° to 180°.

d) Explain with a neat circuit diagram the operation of series inverter.

e) Explain the operation of three phase half wave controlled rectifier with circuit diagram and also sketch it's input and output waveforms.

**Marks**

**5. Attempt any TWO of the following :** **12**

a) Draw circuit diagram and explain the operation of emergency lighting system.

b) Draw and explain the circuit diagram of UJT relaxation oscillator and write the expression for frequency.

c) What is the need of polyphase rectifier ? Draw and explain 3-$\phi$ rectifier (uncontrolled) with R load.

**6. Attempt any TWO of the following :** **12**

a) Name a suitable chopper to increase the output voltage and also explain it's operation with neat circuit diagram using IGBT with R load.

b) State the need of snubber circuit. Draw di/dt and dv/dt protection circuit.

c) Explain two transistor analogy of SCR. Write relation between anode current and gate current.

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