Scheme -I

Sample Question Paper

Program Name : **Diploma in Industrial Electronics**
Program Code : **IE**
Semester : **Fourth**
Course Title : **Applied Power Electronics**
Max. Marks : **70** **Time : 3 Hrs.**

22430

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) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following. **10 Marks**

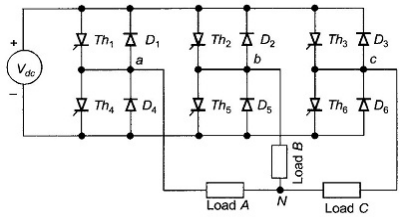
a. Define holding current and latching current.
b. List any four different triggering circuits for phase controlled rectifiers.
c. Sketch the neat of SCR stud mounting technique.
d. State the working principle of dual converter.
e. Describe the working principle of step up chopper.
f. List any four applications of cycloconverters.
g. State the forced commutation methods used in thyristor circuits.

Q.2) Attempt any Three of the following. **12 Marks**

a. Describe with neat sketch working principle of two quadrant chopper.
b. Explain with neat labeled sketch the working of the Three phase half wave controlled rectifier with resistive load.
c. Describe with sketches the operation of firing circuits using logic gates.
d. Explain the effect of saturable core reactor in morgan's chopper.

Q.3) Attempt any Three of the following. **12 Marks**

a. Describe the use of PLL in triggering circuit,
b. Explain with neat sketch the working of parallel capacitor inverter.
c. Identify the circuit and draw output waveform across load A,load B and load C



d. Explain circulatory current mode dual converters with neat labeled circuit diagram.

Q.4) Attempt any Three of the following. 12 Marks

a. Describe full bridge inverter with neat sketch.
b. Describe six pulse half wave controlled rectifier with neat sketch.
c. Compare morgan's chopper with jones's chopper with respect of i) operation ii) application.
d. Explain the necessity of getting synchronized firing pulses for the gate trigger of thyristor in fully controlled converter.
e. List any four applications of phase controlled rectifier explain any one in brief.

Q.5) Attempt any Two of the following. 12 Marks

a. Explain the function of DC chopper using MOSFET with circuit diagram and waveform.
b. State the types of heatsink used in power electronics application and explain any one
c. A Mc-Murray inverter uses a commutation circuit consisting of C=25ůF and L=25ůH the source voltage E_{DC} =230 V dc. The load current varies form 50 to 150A at the instant of commutation. Find the value of torn off time. E_{dc} minimum is 10% of E_{dc}

Q.6) Attempt any Two of the following. 12 Marks

a. Three phase fully controlled rectifier is connected to three phase ac supply of 230V, 50Hz. load current is continuous and has a negligible ripple. If the average load current Idc =150 A and the commutating inductance Lc = 0.1mH. Determine the overlap angle when $\alpha = 10°$.
b. Explain the functioning of four quadrant chopper with respect to output waveform
c. Draw the circuit of single phase to single phase Cycloconverter explain its operation with waveforms.

Scheme - I

Sample Test Paper - I

Program Name : **Diploma in Industrial Electronics**
Program Code : **IE**
Semester : **Fourth**
Course Title : **Applied Power Electronics**
Max. Marks : **20** **Time : 1 Hour**

22430

Instructions:
(1) All questions are compulsory.
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(4) Assume suitable data if necessary.
(5) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **08 Marks**

a. Differentiate between UJT and DIAC

b. Define intrinsic stand of ratio with respect to UJT

c. State merits of Jones's Chopper

d. List different power semiconductor devices

e. Sketch the Symbol of TRIAC with characteristics

f. Differentiate between step up chopper and step down chopper

Q.2 Attempt any THREE. **12 Marks**

a. Interpret the output wave forms of the four Quadrant choppers.

b. Explain with neat diagram the working of single phase controlled rectifier

c. State the function of freewheeling diode in controlled rectifier and its merit.

d. Describe with neat labelled sketch working of UJT triggering circuitfor SCR

e. Explain with neat sketch the function of step up chopper

f. A single phase half wave converter is operated from a 230V,50Hz supply If the load is resistive of value 10 ohms and firing angle α is 60 degree. Determine i) the efficiency ii)ripple factor v)peak inverse voltage of thyristor .

Scheme -I

Sample Test Paper - II

Program Name : **Diploma in Industrial Electronics**
Program Code : **IE**
Semester : **Fourth**
Course Title : **Applied Power Electronics**
Max. Marks : **20** **Time : 1 Hour**

22430

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) Preferably, write the answers in sequential order.

Q.1 Attempt any FOUR. **08 Marks**

a. State the limitations of SCR series inverter

b. List the applications of Dual Converter

c. Give classification of cycloconverters

d. Sketch the neat diagram of snubber circuit

e. Differentiate between half bridge inverter and full bridge inverter.

f. State I^2R rating of thyristor

Q.2 Attempt any THREE. **12 Marks**

a. Draw the circuit diagram of three phase to single phase cycloconverter and discuss briefly.

b. Differentiate between single phase inverter and three phase inverter

c. List different type of scheme of thyristor protection.

d. Explain with sketches the working of the circulatory current free dual converters.

of dual converters Compare CSI and VSI.

a. A single phase full bridge inverter has a resistive load of 2.4 ohms and the DC input voltage of 48 V. Determine the RMS output voltage at the fundamental frequency and the output power.