PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING
MID TERM EXAMINATION - APR 2023

Semester : Semester VI - B.Tech ECE - 2020
Course Code : ECE3016
Course Name : Sem VI - ECE3016 - Electronic Controlled Converters
Program : B.Tech. Electronics and Communication Engineering

Date : 15-APR-2023
Time : 2:00PM - 3:30PM
Max Marks : 60
Weightage : 30%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS   (5 X 2 = 10M)

1. Can we use silicon controlled rectifier (SCR) for DC voltage control applications, if yes justify how DC voltage could be controlled and if no justify why it cannot be used for DC voltage control?

(CO1) [Knowledge]

2. Write the deffination of inverters?

(CO1) [Knowledge]

3. Mention the name of the converter circuit that converts fixed DC to variable DC voltage?

(CO1) [Knowledge]

4. What is the average output voltage value of Half wave AC to DC controlled converter when the input rms voltage is 120V, firing angle is 300 and load is resistive

(CO1) [Knowledge]

5. Mention the peripheral effects of electronic controlled converter? How do you minimize these effects?

(CO2) [Knowledge]

PART B

ANSWER ALL THE QUESTIONS   (2 X 15 = 30M)

6. What if you replace bottom two SCRs by diodes in the circuit of Full wave controlled rectifier (FWCR)? Sketch the output voltage waveform in synchronization with appropriate gate pulse and input voltage. Derive the equation for RMS output voltage?

(CO2) [Comprehension]

7. In the circuit of Fully controlled AC to DC converter, what if you replace any one SCR by a diode? Draw the circuit diagram and output voltage waveform in synchronization with input voltage and gate pulse. Derive an equation for average output voltage?

(CO2) [Comprehension]

PART C

ANSWER THE FOLLOWING QUESTION   (1 X 20 = 20M)

8. In single phase half controlled rectifier if the converter is operated from 230V AC supply with a triggering angle of 300 determine (a) DC output voltage (b) Normalized output voltage (b) RMS output voltage (c) Efficiency (d) Form Factor (e) Ripple Factor (f) Transformer Utilization Factor (g) PIV for resistive load of 10Ω

(CO2) [Application]