KUMARAGURU
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Register Number: ……..

B.E DEGREE EXAMINATIONS: MAY 2015

(Regulation 2009)

Fourth Semester

MECHATRONICS ENGINEERING

MCT106**:** Industrial Electronics

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. A GTO can be turned on by applying

   a) Positive gate signal b) Positive source signal

   c) Positive collector signal d) Positive drain signal

2. Snubber circuit is used to limit the rate of

   a) Rise of current b) Conduction period

   c) Raise of voltage across SCR d) Lowering the current

3. In a three phase semi converter, for firing angle less than are equal to 60 degree , freewheeling diode conducts for

   a) Zero degree b) 30 degree

   c) 60 degree d) 90 degree

4. Comparing with the full wave rectifier using two diodes, the four diode bridge rectifier has the dominant advantage of.

   a) Higher current carrying b) Lower peak inverse voltage requirement

   c) Lower ripple factor d) Higher efficiency

5. The output voltage wave form of a three phase square wave inverter contains

   a) Only even harmonics b) Only nipple harmonics

   c) Only odd harmonics d) Both odd and even harmonics

6. Which type of chopper operate in all modes

   a) Type A b) Type B

   c) Type D d) Type E

7. A cyclo converter is operating on a 50 Hz supply. The range of output frequency that can be obtained with acceptable quality is

   a) 0-16Hz b) 0-32Hz

   c) 0-64Hz d) 0-128Hz

8. A cycloconverters can be considered to be composed of two converters are

a) Series connected b) Parallel connected

c) Series parallel connected d) Connected back to back

9. Optocouplers Combine

a) IGBT and MOSFET b) SITs and BJTs

c) Power transistor and silicon transistor d) Infrared LED and a silicon photo transistor

10. For low speed high power reversible operation, the most suitable drives are

a) VSI fed ac drives b) Cycloconverter fed ac drives

c) CSI fed ac drives d) Dual converter fed ac drives

PART B (10 x 2 = 20 Marks)

11. What are the different methods to turn on the thyristor?
12. Define reverse recovery time.
13. What is the function of freewheeling diodes in controlled rectifier?
14. List the advantages of six pulse converter?
15. Why thyristors are not preferred for inverters?
16. What are the disadvantages of the harmonics present in the inverter system?
17. What type of gating signal is used in single phase ac voltage controller with RL load?
18. Mention some applications of cyclo converter.
19. What is meant by normally open and normally closed circuit relays.
20. Different types of Solid state relays.

PART C (5 x 14 = 70 Marks)

21. a) Discuss the different modes of operation of thyristor with the help of its static VI characteristics.

(OR)

b) Describe in detail about different modes of operation of Triac with the help of VI characteristics.

22. a) Explain the working of 1Φ full converter with RL load and derive the expression for the average and RMS value.

(OR)

b) Explain the operation of three phase full converter? Also Derive the expression for its average output voltage.

23. a) Discuss the functioning of three phase voltage source inverter in 180 deg Operating mode.

(OR)

b) i) Describe any one PWM technique used in inverter in detail. (7)

ii) Explain about Type-E chopper? (7)

24. a) Explain the operation of multistage sequence control of AC voltage controllers with neat diagram.

(OR)

b) Discuss the working of a three phase to three phase cyclo-converter with neat voltage and current waveforms.

25. a) Explain in detail about applications in industrial electronics for process control.

(OR)

b) Write short notes on

i) Induction Heating (7)

ii) Dielectric Heating (7)

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