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Question Paper Code: 57101

B.E./B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Electrical Engineering

15UEE501 - POWER ELECTRONICS

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Determine the loss in the snubber circuit, if $C = 0.545 \mu\text{F}$ and supply is 200 V, 10 kHz. CO1- App
(a) 133.1 W (b) 233 W (c) 333 W (d) 123 W
2. If the chopper frequency is 200Hz and ton time is 2ms, the duty cycle is CO1- R
(a) 0.4 (b) 0.8 (c) 0.6 (d) None of the above
3. A single phase voltage sources square wave inverter feeds pure inductive load. The waveform of the load current will CO2- R
(a) Sinusoidal (b) Rectangular (c) Trapezoidal (d) Triangular
4. The single pulse modulation of PWM inverters, third harmonic can be eliminated if pulse width is equal to CO2- R
(a) 30° (b) 60° (c) 120° (d) None of the above
5. The maximum efficiency of full wave rectification is CO3- R
(a) 40.6% (b) 100% (c) 81.2% (d) 85.6%
6. The ripple factor of a bridge rectifier is CO3- R
(a) 0.482 (b) 0.812 (c) 1.11 (d) 1.21
7. In a single phase full wave controlled bridge rectifier, maximum output voltage and minimum output voltage are obtained at which firing angles? CO4- R
(a) $0^\circ, 180^\circ$ respectively (b) $180^\circ, 0^\circ$ respectively
(c) $0^\circ, 0^\circ$ respectively (d) $180^\circ, 180^\circ$ respectively

8. In a single-phase semi-converter with discontinuous conduction (firing angle is α) and the angle (β) at which current touches zero is $< \pi$, free-wheeling action takes place for CO4- R
- (a) α (b) $\pi - \beta$ (c) $\beta - \pi$ (d) zero degree
9. The triac can be used only in CO5- R
- (a) Inverter (b) Rectifier (c) Multiquadrant chopper (d) Cycloconverter
10. Cyclo-converter converts _____ CO5- R
- (a) ac voltage at supply frequency to ac voltage at load frequency
- (b) ac voltage to dc voltage
- (c) dc voltage to dc voltage
- (d) ac voltage to ac voltage at same frequency

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Draw the switching characteristics of MOSFET and explain it. CO1- U (8)
12. Explain in detail about the space vector Modulation with neat diagram CO2- U (8)
13. Analyze the working of a single phase full wave diode bridge rectifier feeding resistive load. CO3- Ana (8)
14. Discuss the working of six pulse converter and draw the relevant waveforms. CO4- Ana (8)
15. Explain about single phase Half Wave voltage converter. CO5- Ana (8)