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**Question Paper Code: 52512**

M.E. DEGREE EXAMINATION, NOV 2016

First Semester

Power Electronics and Drives

15PPE102 - ANALYSIS OF POWER CONVERTERS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. In a single- phase semi converter, if output voltage has peak and average values of 325 and 133V respectively, the firing angle is  
(a) 40                      (b) 73.40                      (c) 80                      (d) 140
2. For a waveform more peaky than a sine wave, the form factor will be  
(a) more than 1.11                      (b) less than 1.11  
(c) 1.11                      (d) 1
3. In dc choppers per unit ripple is maximum when duty cycle d is  
(a) 0.2                      (b) 0.5                      (c) 0.7                      (d) 0.9
4. In class A and class B commutation the resonating circuit has to be  
(a) Over damped                      (b) Critically damped  
(c) Under damped                      (d) Negatively damped
5. The cycloconverter require natural or forced commutation as under  
(a) Natural commutation in both step-up and step down cycloconverter  
(b) Forced commutation in both step-up and step-down cycloconverter  
(c) Forced commutation in step-up cycloconverter  
(d) Forced commutation in step-down cycloconverter

PART - B (5 x 3 = 15 Marks)

6. State the advantages and disadvantages of GTO over SCR.

7. What is overlap? Why it does it occur in the converter?
8. What is the duty cycle of chopper?
9. What are the application of AC Voltage controllers?
10. Define modulation index of PWM. What is its use?

PART - C (5 x 16 = 80 Marks)

11. (a) Explain the the performance parameter of 1  $\phi$  fully controlled converter with RL load. (16)

Or

- (b) Discuss the operation of dual converter with and without circulating current, bring out its advantages and disadvantages. (16)

12. (a) What is overlap angle? And explain the effect source induce in 3 $\phi$  fully controlled converter in detail. (16)

Or

- (b) With neat circuit diagram, explain the operation of three phase3 semi controlled reactifier supplying wityh RL load. Sketch the output voltage waveforms for the three different firing angles. (16)

13. (a) Describe the working principle of two quadrant operation of DC-Dc converter with relevant waveforms. (16)

Or

- (b) Explain the operation of Buck converter with neat sketches. (16)

14. (a) Explain the operation of 3 $\phi$  AC voltage controller with neat sketch. (16)

Or

- (b) With neat sketch and relevanty waveforms, Explain the operation of three phase bidirectional AC voltagae regulator with delta connected loads. (16)

15. (a) Explain the various modes of operation of load commutated cycloconverters converter with neat sketches and waveforms. (16)

Or

- (b) Describe the basic principle of a single phase to single phase cycloconverter for both continous and discontinous conduction modes. (16)