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Question Paper Code : 53424

B.E./ B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Fifth Semester

Electrical and Electronics Engineering

EE 1301– POWER ELECTRONICS

(Common to Electronics and Instrumentation Engineering/ Instrumentation and Control Engineering and Common to B.E.(Part-Time) Fourth Semester–Regulation 2005)

(Regulations 2004)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Why are IGBT becoming popular in their application to controlled converters ?
2. What are the factors that influence the turn-off time of a thyristor ?
3. Define : Displacement factor
4. State the advantages of a single phase circulating type dual converter.
5. Define the term duty cycle in DC-DC converters
6. What is DC chopper ?
7. What is current source inverter ?
8. What are the advantages of PWM inverter ?
9. Name any two types of FACT devices.
10. What is Off-line UPS ?

PART – B (5 × 16 = 80 Marks)

11. (a) Discuss the transfer, output and switching characteristics of power MOSFET.

OR

- (b) Explain the switching performance of BJT with relevant waveforms indicating clearly the turn-on, turn-off times and their components. Also define the term SOA.

12. (a) Explain the operation of three phase full converter. Also derive the expression for its average output voltage. **(16)**

OR

- (b) A single phase full wave AC voltage controller has an input voltage of 230 V, 50 HZ and it is feeding a resistive load of 10 ohms. If firing angle of thyristor is 110 degree, find the output RMS voltage, input power factor and average current of thyristor. **(16)**

13. (a) Describe the principle of operation of cuk converter and Buck converter with necessary waveforms.

OR

- (b) With a neat diagram, explain any two types of resonant converters.

14. (a) (i) Describe the working of a 1 phase full bridge inverter with relevant circuit and waveforms. **(8)**

- (ii) What is PWM ? List the various PWM techniques and explain any one of them. **(8)**

OR

- (b) (i) Discuss the working of a single phase series resonant inverter with appropriate circuit and waveforms. **(8)**

- (ii) With a neat circuit and relevant waveforms, discuss the operation of an ideal single phase CSI. **(8)**

15. (a) Explain the operation of On-line and Off-line UPS in detail

OR

- (b) Write short notes on :

- (i) UPFC **(8)**

- (ii) Static VAR compensation **(8)**