Reg. No. : | | | | | | | | | | |

Question Paper Code: 31654

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fifth Semester

Instrumentation and Control Engineering

01UIC504 – POWER ELECTRONICS AND APPLICATIONS

(Regulation 2013)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Define firing angle in the operation of SCR.
2. What are the different methods to turn on the thyristor?
3. List the effects of source inductance.
4. What is the effect of freewheeling diodes in semi converter circuit?
5. Define modulation index of inverter.
6. What is a step up chopper?
7. Identify the reason for thyristor are not preferred for inverters?
8. Mention the advantages of PWM control?
9. Write the applications of cycloconverter.
10. What do you mean by integral cycle control method?

PART - B (5 x 16 = 80 Marks)

11. (a) Describe the basic structure of power MOSFET and explain the principle of operation with neat diagram also discuss its switching characteristics. (16)

Or

(b) Discuss how static and dynamic equalizing circuits serve to equalize the distribution of voltage in a string of series connected SCRs. (16)

12. (a) Describe using a power circuit and associated waveforms the working of a 6 pulse converter. (16)

Or

(b) (i) Summarize the working of dual converter. (8)

(ii) A three phase half wave controlled rectifier has a supply of 200*V*/phase. Determine the average load voltage for firing angle of 0^0, 30^0, 60^0. Assuming a thysistor voltage drop of 1.5*V* and continuous load current. (8)

13. (a) Describe the operating principle of buck-boost converter with block diagram. (16)

Or

(b) (i) Briefly discuss the SMPS operation with neat block diagram. (10)

(ii) Differentiate between ZCS and ZVS converter? (6)

14. (a) Describe using equivalent circuits, the operation of a three phase bridge inverter with star connected load in the 120 and 180 degree modes. (16)

Or

(b) State different methods of voltage control inverters. Describe about different PWM control in inverter with the significance of harmonic control. (16)

15. (a) Write the objectives and necessity of matrix converters with illustrations. (16)

Or

(b) Explain the operating principles of three phase cycloconverter in detail. (16)

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