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Question Paper Code: 35064

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

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 is di/dt protection of thyristor?
3. Write the function of SMPS.
4. Define commutation angle or overlap angle.
5. Define modulation index of inverter.
6. Give the applications of DC chopper?
7. What is a step up chopper?
8. What is time ratio control of DC chopper?
9. Write the applications of cycloconverter.
10. What are the different compensation schemes?

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) Describe the turn ON and OFF operations of an IGBT using basic structure. (16)
12. (a) Write brief notes on operation of reactive power control of converters. (16)

Or

- (b) Describe using a power circuit and associated waveforms the working of a 6 pulse converter. (16)
13. (a) Describe the operating principle of buck-boost converter with block diagram. (16)

Or

- (b) Explain the principles of resonant switching based SMPS. (16)
14. (a) Describe the operation of series resonant inverter with suitable diagrams. (16)

Or

- (b) Describe using equivalent circuits, the operation of a three phase bridge inverter with star connected load in the 120 and 180 degree modes. (16)
15. (a) Explain the operating principles of three phase cycloconverter in detail. (16)

Or

- (b) Write the objectives and necessity of matrix converters with illustrations. (16)
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