F 3623 (Pages : 2) Reg. No.....

Name.....

B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Fifth Semester

Branch : Applied Electronics and Instrumentation/Electronics and Instrumentation/ Instrumentation and Control Engineering

AI 010 502
EI 010 502
IC 010 502
—INDUSTRIAL ELECTRONICS AND APPLICATIONS (AI, EI, IC)

(New Scheme——2010 Admission Onwards—Regular/Improvement/Supplementary)

Time : Three Hours Maximum : 100 Marks

Part A

Answer **all** *questions.*
Each question carries 3 *marks.*

1. What is the difference between power diodes and power BJTs ? Explain.
2. State and explain free wheeling effect.
3. Draw an RC triggering circuit and explain its working in detail.
4. Explain the principle of DIAC with a neat diagram.
5. What is the need for Isolation ? Explain in detail.

(5 × 3 = 15 marks)

Part B

Answer **all** *questions.*
Each question carries 5 *marks.*

6. Explain the characteristics of IGBT in detail. Mention its potential applications in detail.
7. Explain the working principle of Dual converters with neat diagrams.
8. What is are the potential applications of SMPS ? Explain.
9. Explain the slip power recovery system for a single phase.
10. Explain the basic schemes for pulse generation using digital ICs.

(5 × 5 = 25 marks)

Part C

Answer **all** *questions.*
Each full question carries 12 *marks.*

11. (i) Explain the characteristics of TRIAC with diagrams in detail.

Turn over

(ii) The brightness of a 100 W, 110 V lamp is to be varied by controlling firing angle of SCR full wave circuit. The RMS value of a.c. voltage appearing across each SCR is 110 V. Find the RMS voltage and current in the lamp and firing angle of 60 deg.

Or

12. (i) Explain the differences between DIAC and TRIAC.

(ii) Give an account on : (1) MCT ; (2) LASCR ; (3) Power MOSFET.

13. (i) Draw a half controlled rectifier and explain its principle of operation. Bring out its design details.

(ii) Write a technical note on "Freewheeling effect and Free wheeling diode".

Or

14. (i) Discuss the power factor improvement methods for phase controlled rectifiers with neat diagrams.

(ii) Give an account on "PWM chips and its applications".

15. (i) Explain the characteristics of UPS with a neat diagram.

(ii) Draw a neat bock diagram of SMPS and explain its principle of operation.

Or

16. (i) Draw a neat block diagram of a linear mode power supply and explain its working principle in detail.

(ii) Draw AC chopper and explain its principle of working in detail.

17. (i) Explain the concept of PLL control of d.c. motor with a neat diagram.

(ii) Explain the types of stepper motors in detail.

Or

18. Explain the following in detail with diagrams :—

(i) Chopper controlled DC drives

(ii) Three phase SCR drives.

19. (i) Discuss the types of control circuits for power electronics with diagrams.

(ii) Give an account on "Cable firing".

Or

20. Write technical notes on :

(i) Series operation of Thyristor ;

(ii) Characteristics of Thyristor.

(5 × 12 = 60 marks)