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T 3246

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2008.

Second Semester

Polymer Technology

EE 1163 — ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Bio-Technology)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between D.C. and A.C. sources with their waveforms with respect to time.
2. What is meant by electrical power? Give different forms of expression for electrical power.
3. Define armature reaction of a D.C. machine.
4. What is all-day efficiency of a transformer?
5. What are the applications of PN junction diode?
6. What is Fermi level?
7. Define transistor biasing.
8. Write the expression for resonant frequency.
9. What is Barkhausen criterion?
10. What is an IC? What are the advantages of ICs?

PART B — (5 × 16 = 80 marks)

11. (a) (i) A circuit consisting of a resistor of 10Ω and a capacitor of $100\ \mu F$ connected in series, is applied with 200 V supply at 50 Hz. Find the current, power and power factor. (8)
- (ii) Explain with neat diagram, the working principle of a moving iron type volt meter. (8)

Or

- (b) (i) Three identical resistors of 20Ω are connected in star to a 415 V, three-phase, 50 Hz supply.
- (1) Calculate the total power taken by the load. (4)
- (2) Also calculate the power consumed in the resistors if they are connected in delta to the same supply. (4)
- (ii) Explain with neat diagram, the working principle of a moving coil type volt meter. (8)
12. (a) Explain the principle of operation of a single phase transformer and derive the EMF equation of a transformer. (16)

Or

- (b) (i) Explain the principle of operation of single phase induction motor. (8)
- (ii) A D.C. series generator delivers a load of 20 kW at 400 V. Its armature and series field resistances are 0.3Ω and 0.2Ω respectively. Calculate the generated EMF and the armature current. Allow 1.1. V per brush for contact drop. (8)
13. (a) (i) Explain intrinsic and extrinsic semiconductors with neat diagrams. (8)
- (ii) Explain the characteristics of a P-N junction diode under forward and reverse biasing. (8)

Or

- (b) (i) What is a zener diode? Explain the operation of zener diode and draw its characteristics. (8)
- (ii) Derive an expression for efficiency of a full-wave rectifier. (8)

14. (a) With neat diagram explain the operation of PNP common emitter transistor. (16)

Or

- (b) (i) Compare CB, CE and CC transistor configurations. (8)
(ii) With a circuit diagram explain the operation of class 'C' power amplifier. (8)
15. (a) What are the essential components of a transistor oscillator? Explain the operation of Hartley oscillator with neat diagram. (16)

Or

- (b) (i) Explain the working of differentiator circuit using operational amplifiers. (8)
(ii) Draw and explain the working of bistable multivibrator. (8)