E 9101

B.Sc. (Applied Science) DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

First Year

Apparel and Fashion Technology

FT 1.6 – BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Kirchoff's current law and voltage law.

2. Define active and reactive power.

3. The DC series motor should not be started without load. Why?

4. Which characteristics is called mechanical characteristics of a DC motor.

5. Draw the transfer characteristics of a zener diode.

6. Draw the circuit diagram to determine the input characteristics of a NPN transistor in common emitter configuration.

7. Define ripple factor.

8. Define the bandwidth of an amplifier.

9. What type of feedback is used in oscillators?

10. What happed to gain and stability of an amplifier because of the feedback?

PART B — (5 × 16 = 80 marks)

11. (i) Explain the features of star connected system and derive the expression for line voltage for the same. (8)

(ii) A balanced star connected load of (8+j6) Ω/phase is connected to a balanced 3–ϕ, 400V supply. Find the line current, power factor and total volt-ampere. (8)

12. (a) (i) Derive the expression for torque in a D.C. machine. (8)

(ii) What is the speed of a 4-pole, 440V, DC motor having a flux/pole of 3×10^{-2} wb. Simple wave winding, 39 slots, 12 conductors per slot, winding resistance 0.25 Ω and armature current of 80 amperes. (8)

Or

(b) (i) Explain in detail the torgue – slip characteristics of a three phase inchretion motor. (8)

(ii) Explain how the parameters of the equivalent circuit of a transformer can be determined using open-circuit and short circuit tests. (8)

13. (a) (i) Explain the principle and V-I characteristics of a PN junction diode with necessary sketches. (8)

(ii) Explain the principle of operation of JFET and bring out the advantages oven BJT. (8)

Or

(b) (i) Explain have the tramistor can be used as an amplifier. (8)

(ii) Explain the principle of operation of MOSFET. (8)

14. (a) (i) Derive the expression for efficiency and ripple factor of a helfwave rectifier. (8)

(ii) Draw and explain the overload protection circuit used in D.C power supply. (8)

Or

(b) (i) Draw the circuit diagram and explain the principle of operation of a RC coupled amplifier. (8)

(ii) Draw the frequency response characteristics of a RC coupled amplifier and explain different frequency region. (8)

15. (a) (i) Explain the principle of oscillator and derive the condition for oscillation. (8)

(ii) Draw the circuit diagram and explain the voltage feedback amplifiers. (8)

Or

(b) (i) Explain the principle of operation of any one type of oscillator with net sketch. (8)

(ii) Explain the effect of negative feedback on an amplifier. (8)

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