

Common to TT, FT

Reg. No. :

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T 3488

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

Third Semester

(Regulation 2004)

Textile Technology

TT 1201 — ELECTRICAL ENGINEERING

(Common to Textile Technology (Textile Chemistry) and
Textile Technology (Fashion Technology))

Time : Three hours

Maximum : 100 marks

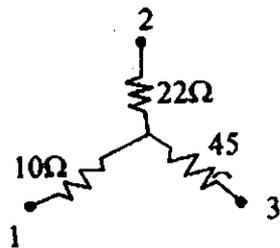
Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is the importance of standards and units?
2. State and explain Kirchoff's Laws.
3. How is r.m.s. value calculated for an a.c. signal?
4. What is the advantage of a three phase system?
5. What are advantages of parallel operation of DC generator?
6. What is the need for starter for a DC shunt motor?
7. What is effect of Leakage reactance of windings on the performance of the transformer?
8. Why is the v/f kept constant in the speed control of an induction motor?
9. What is poor grounding effect on indicating instruments?
10. What is creepage error of a Wattmeter?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Differentiate between (1) time variant and time invariant sources (2) dependent and independent sources. (6)
- (ii) (1) Derive the star-delta transformation (2) hence convert the given network and find the equivalent delta values resistances. (10)



Or

- (b) (i) Explain the LENZ'S LAW and Hysteretic curve derive the equivalent capacitance for a circuit if has 3 capacitors in parallel and in series. (10)
- (ii) Two coupled coils have self inductances

$$L_1 = 10 \times 10^{-3} H \text{ and } L_2 = 20 \times 10^{-3} H.$$

The coefficient of coupling (k) being 0.75 in air. Find voltage in the second coil and flux of first coil provided the second coil has 200 turns and the circuit current is given by $i_1 = 3 \sin 314t$ Amp. (6)

- 12: (a) (i) Explain the terms admittance, conductance and susceptance. (6)
- (ii) A series RLC circuit is connected to 230 V a.c. supply. The current drawn by the circuit at resonance is 25 A. The voltage drop across the capacitor is 2000 V at series resonance. Calculate the resistance, inductance if capacitance is $6 \mu f$, also calculate the resonant frequency. (10)

Or

- (b) (i) Obtain an expression for the average power consumed by an a.c. circuit in terms of r.m.s. values of voltage, current and power factor. (6)
- (ii) A voltage $e = 300 \sin 100\pi t$ is applied to a load having $R = 350 \Omega$ in series with $L = 730 \text{ mH}$. Estimate expression for current in $I = I_m \sin(\omega t + \phi)$ from; the power consumed by the load. (6)
- (iii) The reactive power of the load and (2)
- (iv) The voltage across R, L . (2)

13. (a) Explain the principle of operation and construction of a DC generator. Explain briefly on the condition for self excitation and effect of speed on OCC. (16)

Or

- (b) Explain briefly on commutator and on armature reaction in a d.c. Machine. With a neat diagram of a three point stator. Explain how the overload protector and speed control is achieved in a DC shunt motor. (16)

14. (a) (i) Explain with neat figures the construction cooling and operation of a single phase transformer. (8)
(ii) Derive the E.M.F. equation and list any four applications of a transformer. (8)

Or

- (b) Explain briefly on any two of the following : (2 × 8 = 16)
(i) Open circuit and short circuit test of transformer.
(ii) Core loss and eddy loss in transformer.
(iii) Principle of operation of 3-phase induction motor.
15. (a) With neat figures explain the principle and construction of the following :
(i) Attraction type moving iron instrument and (8)
(ii) Permanent magnet type moving coil instrument (8)

Or

- (b) Write briefly on any two of the following : (2 × 8 = 16)
(i) Torque in indicating instruments
(ii) Measurement of power using two wattmeter methods
(iii) Induction type energy meter.