Reg. No. : | | | | | | | | | | | | |

Question Paper Code : P 1565

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2009.

Third Semester

Textile Technology

TT 1201 — ELECTRICAL ENGINEERING

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

(Regulation 2004)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Explain the Faraday's Law.

2. What is the advantage of a three phase system?

3. In a series R-L circuit, R = 300 ohms which L = 6 mH The input current lags the supply voltage by 80°. Obtain the value of applied frequency.

4. What is the need for wye - delta starter?

5. The synchronous machine produces reactive power when operated in over excited state. Give the significance and application of these characteristics.

6. What is KVA rating of a transformer?

7. Why a DC series motor cannot be started on no-load?

8. Give two reasons on why induction motors are used extensively for textile industries as machine drives?

9. What is the importance of calibration in measuring instruments?

10. What is the importance of grounding of equipments?

PART B — (5 × 16 = 80 marks)

11. (a) Three identical choke coils are connected as a delta load to a three phase supply. The line current drawn from the supply is 15 A and total power consumed is 75 kW. The kVA input to the load is 10 kVA. Find out

(i) Line and phase angle

(ii) Impedance/phase

(iii) Reactance/phase

(iv) Resistance/phase

(v) Power factor

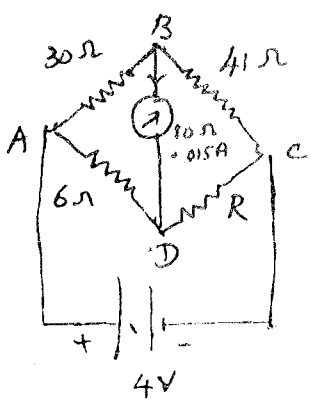
(vi) Phase current

(vii) Inductance(if frequency is 50 Hz)/phase. (16)

Or

(b) In the bridge circuit given below the resistance of branch AB = 30 Ω, BC = 41 Ω, AD = 6 Ω, While a 4 V battery is connected between points A and C, an ammeter with internal resistance of 10 Ω, is connected between points B and D.

The resistance of branch CD is 'R' Ω. If ammeter is showing a reading of 15 mA determine the value of R using KVL.



12. (a) (i) Write briefly on the line, phase voltage and current parameters for three phase supply with star, delta load.

(ii) Draw the phasor diagram for a series R-L-C circuit energized by a sinusoidal voltage showing relative positions of current, voltage when $X_L > X_C$ and $X_L = X_C$. (8 + 8)

Or

(b) (i) Derive the expression for resonance in parallel circuit. Also obtain the expression for its quality factor.

(c) A series circuit having pure resistance of 8Ω, pure inductance of 30 mH and a capacitor is connected across a 230 V, 50 Hz a.c. supply. This R, L, C circuit draws a current of 5 A. (5 + 8)

Calculate :

(1) power factor of the circuit

(2) capacitor value.

13. (a) (i) What is a difference between generator and a motor?

(ii) Explain the principle of working of DC motor with giving the speed torque characteristics with neat figures. (3 + 13)

Or

(b) (i) What is significance of back e.m.f.?

(ii) A DC shunt generator has shunt field winding resistance of 100Ω. It is applying a load of 5 kW at a voltage of 250 V. If its armature resistance is 0.22Ω, calculate the induced e.m.f of generator. (3 + 13)

14. (a) Explain the construction of a single phase transformer, and on its winding types. Explain the regulation and efficiency of a transformer. (8 + 8)

Or

(b) (i) Give the construction and principle of operation of three-phase squirrel cage type induction motor.

(ii) Explain the Speed-torque characteristic of the split-phase induction motor. (8 + 8)

15. (a) (i) What is the torques necessary for the operation of an indicating instrument?

(ii) With neat figure explain the working principle of the permanent magnet type moving coil instrument. (8 + 8)

Or

(b) Write briefly on any TWO of the following : (8 + 8)

(i) Classification of measuring instruments

(ii) Dynamometer wattmeter.

(iii) Induction type energy meter.