M 2079

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2006.

Third Semester

Textile Technology

TT 1201 — ELECTRICAL ENGINEERING

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

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the formula for star to delta and delta to star transformation.

2. Define self and mutual inductances.

3. Find the R.M.S. value of the saw tooth wave of period T and magnitude V.

4. Define Form factor.

5. What is the function of commutator?

6. State the principle of self excited generator.

7. Draw the slip torque characteristics of three phase Induction Motor.

8. What are the two types of alternators?

9. What are all the types of damping employed in indicating instruments?

10. In two watt meter method of measuring power, if one watt meter reads zero, what will be the power factor?

PART B — (5 × 16 = 80 marks)

11. (i) State and prove maximum power transfer theorem. (8)

(ii) Find the current flowing in the branch AB using mesh method. (8)
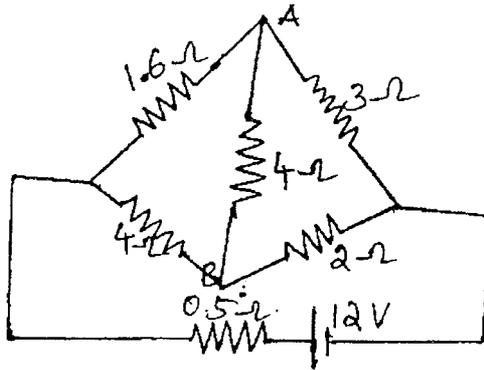
12. (a) (i) In the following circuit, the voltage across the 5Ω resistor is 60 V. Find the total current. (8)
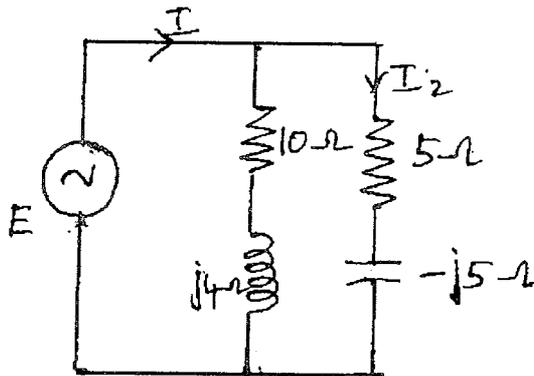
(ii) A series RLC circuit has R = 5Ω, L = 40 mH and C = 1μF. Calculate :

(1) the Q of the circuit

(2) the separation between half power frequencies

(3) the resonant frequency and

(4) the half power frequencies. (8)

Or

(b) (i) A three phase, balanced delta connected load of (4 + 8j)Ω is connected across a 400 V, 3Φ balanced supply. Determine the phase and line currents. Assume the phase sequence to be RYB. Also calculate the power drawn by the load. (8)

(ii) Explain the two wattmeter method of measuring 3Φ power. (8)

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(a) (i) Derive from first principle, an expression for the emf of a generator. (8)

(ii) A 4 Pole, wave connected shunt generator is supplying a load of 50 KW at 400 V. The armature and field resistances are 0.05 Ω and 100 Ω respectively. Calculate the field, armature currents and induced voltage on open circuit. Take brush contact drop as 1V per brush. (8)

Or

(b) (i) Draw and explain a three point starter for a DC motor. (8)

(ii) A 250 V d.c shunt motor has Ra = 0.08Ω when connected to 250 V d.c supply. It develops back emf of 242 V at 1500 rpm. Determine :

(1) Armature Current

(2) Armature Current at start

(3) Back emf if armature current is changed to 120 A

(4) Speed of the machine if it is operated as a generator in order to deliver an armature current of 87 A at 250 V. (8)

(a) (i) Derive the EMF equation of the transformer. (8)

(ii) The primary and secondary windings of a 500 KVA transformer have resistances 0.4Ω and 0.001Ω respectively. The primary and secondary voltages are 6600 V and 400 V respectively. Then iron loss is 3 KW. Calculate the efficiency on full load, the load power factor being 0.8 lagging. (8)

Or

(b) Explain in detail the synchronous impedance method of finding regulation for an alternator. (16)

(a) Explain the construction and working of induction type energy meter with neat sketch. (16)

Or

(b) Explain the construction and working of moving iron instruments with neat sketch. (16)

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