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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

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. Write an expression for the force experienced by a current carrying conductor placed in a magnetic field.

2. Define time period and frequency of an alternating quantity.

3. What is the phasor relationship between the voltage and current in a purely resistive circuit and a purely capacitive circuit?

4. What are the components of a power triangle?

5. In every motor, generator action occurs and in every DC generator, motor action occurs. Justify.

6. What are the different methods of speed control of DC motor?

7. Draw the slip-torque characteristics of a three phase induction motor.

8. What is meant by synchronous speed and give the expression of it?

9. What are the different methods of producing damping torque in an indicating instrument?

10. Write the expression for star connected impedance equivalent to delta connected impedance.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Find the equivalent resistance across AB of the circuit shown in fig.
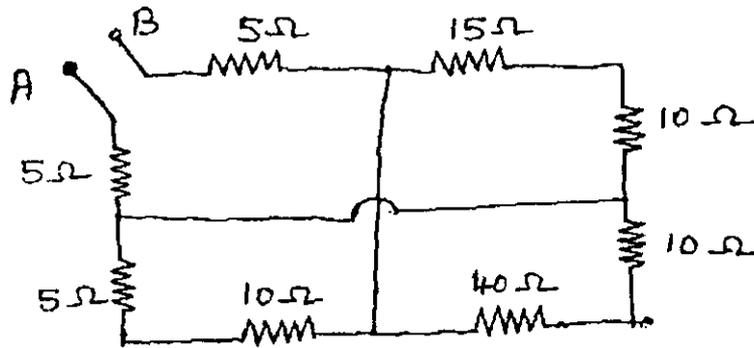

(ii) Two batteries A and B are properly connected to supply a current of 160 A to a load resistance R_L. Calculate E_B and R_L by Mesh Analysis method.
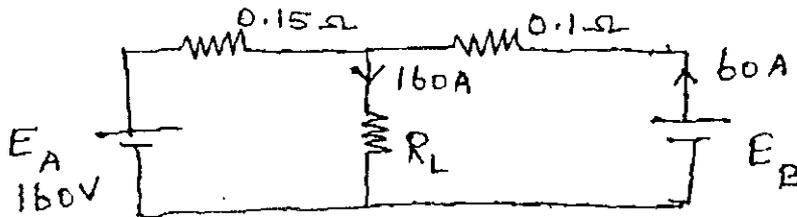
Or

(b) (i) Explain Faraday's laws of electromagnetic induction.

(ii) What is meant by co-efficient of coupling and obtain an expression for it in terms of self and mutual inductances?

12. (a) (i) Define RMS and Average value of an alternating quantity.

(ii) Determine the average value and RMS value of the saw-tooth waveform shown in Fig.

Or

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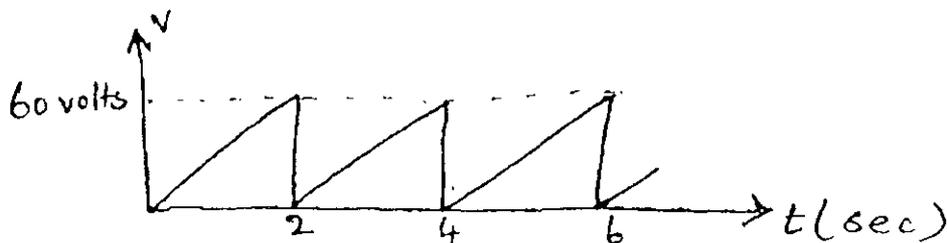
(b) (i) What is meant by resonance? Obtain an expression for resonance condition, bandwidth, half power frequencies in a RLC series circuit?

(ii) Explain briefly how three phase power can be measured using only two wattmeters.

13. (a) (i) Explain the principle of operation of DC generator.

(ii) Draw the open circuit and load characteristics of DC shunt and DC series generator.

Or

(b) (i) Explain the Swinburne's test to predetermine the efficiency of a DC machine.

(ii) Obtain the expression for the efficiency of the DC machine both as a motor and as a generator using the observations from the Swinburne's test.

14. (a) (i) Explain the construction & principle of operation of a single phase transformer.

(ii) What is the condition for maximum efficiency of a single phase transformer?

Or

(b) (i) What is meant by voltage regulation of an alternator?

(ii) Explain the Synchronous impedance method of predetermining the voltage regulation of an alternator.

15. (a) (i) Explain the construction and working of a PMMC type of instrument.

(ii) What are the different torques involved in the operation of an indicating instrument?

Or

(b) (i) Explain the construction & principle of operation of induction type energymeter.

(ii) How is the damping torque provided in this type of meters?

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