C 205

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Third Semester

Textile Technology / Textile Chemistry / Fashion Technology

TT 1201 — ELECTRICAL ENGINEERING

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate between two conductors having resistances R_1 and R_2 are connected in (a) series (b) parallel.

2. State the two Faraday's Laws of electromagnetic induction.

3. Define the effective (RMS) value of an alternating current.

4. Draw the waveforms and phasor diagram of 3 phase balanced voltages.

5. Draw the connection diagrams of D.C. shunt generator and series generator.

6. Why d.c. motors are to be started with starters?

7. Discuss the purpose of a transformer.

8. What are the components of a transmission line?

9. Compare moving coil and moving iron instruments.

10. Mention the suitable instrument to measure current (d.c.), voltage (a.c.), power and energy.

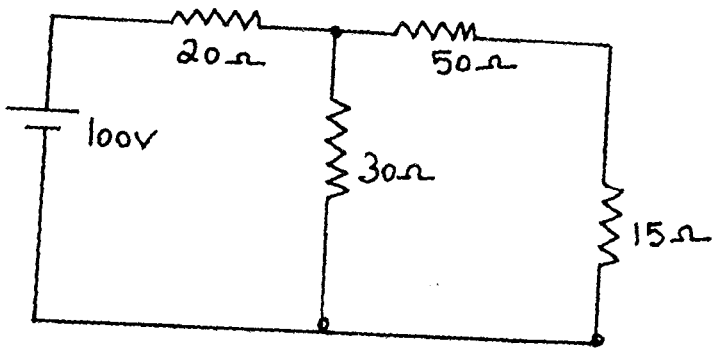
PART B — (5 × 16 = 80 marks)

11. (i) Describe the constructional details of 3 phase squirrel cage induction motor. (12)

(ii) An induction motor having six poles operates on 50 Hz supply. If it works on full load at 960 rpm, find the percentage slip. (4)

12. (a) (i) State and explain Kirchoff's laws.

(ii) Using Kirchoff's voltage law determine the total current drawn from the source and also current in the 15 ohms resistance of the following circuit.



Or

(b) (i) Describe Fleming's Right hand rule and left hand rule. (6)

(ii) Explain the following terms : (10)

(1) resistance

(2) reluctance

(3) magnetic flux density

(4) relative permeability

(5) eddy currents

13. (a) (i) The equation of an alternating current is $i = 62.35 \sin 323\ t$ Amps. Determine its max. value, frequency, rms value and form factor. (8)

(ii) An alternative voltage of $(160 + j120)$ V is applied to a circuit and the current in the circuit is given by $(6 + j8)$ A. Find the values of elements of the circuit, power factor and the power consumed. (8)

Or

(b) Three impedances, each having a resistance of 8 ohms and inductive reactance of 6 ohms, are connected in (i) star; (ii) delta across 3 ph, 400 V system. Find phase current, line current and power consumed for both connections. (16)

14. (a) Draw a neat sketch of a d.c. generator and explain the functions of its main parts. (16)

Or

(b) A d.c. shunt generator delivers an output of 100 kW at 500 V when running at 800 rpm. The armature and field resistances are 0.1 Ω and 100 Ω respectively. Calculate the speed of the same machine when running as a shunt motor and taking 100 kW input at 500 V. Contact drop 2 Volt. (16)

15. (a) Describe the construction details of induction type energy meter and explain its principle of operation. (16)

Or

(b) The power input to a 2000 V, 50 Hz, 3 ph. motor running on full load at an efficiency of 90% is measured by two wattmeters which indicate 300 kW and 100 kW respectively. Find the input, power factor, line current and output. (16)

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