Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : S 4646

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

Second Semester

Civil Engineering

EE 151 — ELECTRICAL ENGINEERING

(Common to B.E. Mechanical Engineering / Chemical Engineering / Industrial Biotechnology / Polymer Technology / Textile Chemistry / Textile Technology and Mechatronics Engineering)

(Regulation 2001)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State Ohm's Law.

2. Define the term "Energy".

3. Define RMS Value.

4. What is the function of commutator in DC Generators?

5. What do you mean by eddy current loss?

6. List out any two applications of single phase Induction motors.

7. What are all the types of connection in three phase Transformer?

8. Write down the types of rotors in three phase Induction motors.

9. What are all the types of Moving Coil Meters?

10. Write down the deflecting torque equation of dynamometer wattmeter.

11. (a) (i) Two batteries A and B are properly connected to supply a current of 160 A to a load resistance R_L. $E_A = 120V$, $R_A = 0.15\Omega$, $R_B = 0.1\Omega$ and $I_B = 60A$. Calculate E_B and the Load Power. (8)

(ii) A pure Inductance L = 0.1H has an applied voltage of $e = 200\sin 314t$. Find the current, the instantaneous and average power. Find also the inductive reactance and the RMS current. (8)

Or

(b) Find the power delivered by the batteries of the following circuit. (16)
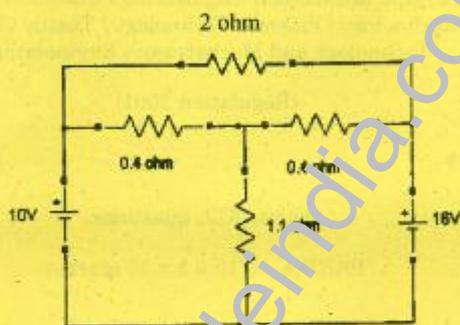
12. (a) A Series circuit has $R = 10\Omega$, $L = 50mH$ and $C = 100\mu F$ and is supplied with 20V, 50Hz supply. Find the impedance, the current, the power, the power factor and the voltage drop across each element. (16)

Or

(b) (i) Each phase of a 3 phase Alternator produces a voltage of 6,351 volts and can carry a maximum current of 315 A. Find the line voltage, maximum line current and total KVA capacity of the Alternator if it is

(1) Star connected and

(2) Delta connected. (8)

(ii) A 3 phase 400 V supply is given to a balanced star connected load of impedance $8 + j6\Omega$ in each branch. Find the line current, power factor and total power. (8)

13. (a) Explain the construction and operation of DC Generator with neat sketches. (16)

Or

(b) (i) Describe the process of building up of emf in a DC shunt generator. (8)

(ii) Explain the no load and load saturation characteristics of DC shunt generator. (8)

14. (a) Describe the construction and operating principle of 3 phase Induction motor. (16)

Or

(b) Discuss the operating principle of single phase Induction motor and also explain why it is not self starting? (16)

15. (a) Explain the operating principle of attraction type moving iron instrument with a neat sketch. (16)

Or

(b) (i) Explain the theory and operation of dynamometer wattmeter. (10)

(ii) Write short notes on driving system and registering systems of Energy meters. (6)

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