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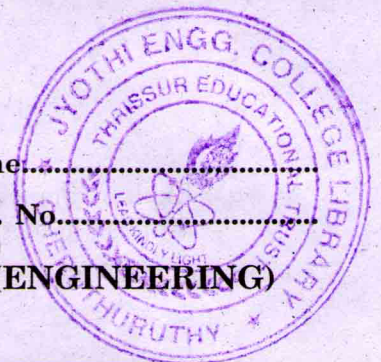
COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, APRIL 2012

EN 09 107—BASICS OF ELECTRICAL, ELECTRONICS AND COMMUNICATION ENGINEERING

Time : Three Hours Maximum : 70 Marks

Section 1 (Basics of Electrical Engineering)

PART A

*Answer **all** questions.*

1. State Faraday's second law of electromagnetic induction. (1 mark)

2. What is the equation of a 25 Hz current sine wave having an R.M.S. Value of 30 A ? (2 marks)

3. A d.c. motor connected to a 460 V supply has an armature resistance of 0.15 Ω. Calculate the value of back e.m.f. when the armature current is 120 A.

(2 marks)
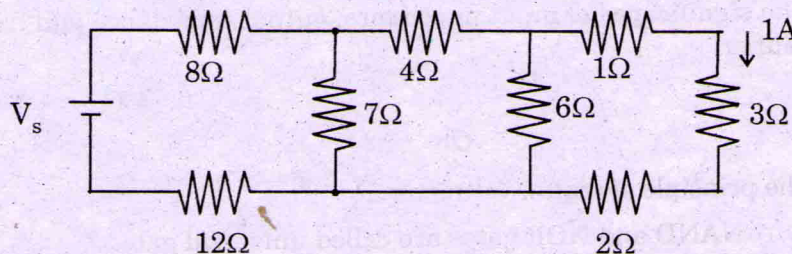
PART B

*Answer any **two** questions.*

4. Explain what is meant by self inductance and mutual inductance. (5 marks)

5. Compare star and delta connections. (5 marks)

6. Explain the working principle of a single-phase transformer. (5 marks)

[2 × 5 = 10 marks]

PART C

*Answer **all** questions.*

7. (a) For the circuit given below, find the source voltage V_s if the current through 3Ω resistor is 1A.

(10 marks)

Or

(b) (i) Derive equations for current, impedance and power factor in an R.L.C. circuit.

(6 marks)

(ii) Derive the voltage and current relationships in balanced delta connection.

(4 marks)

Turn over

8. (a) Explain the construction and principle of operation of squirrel cage and wound rotor type 3-phase induction motor.

(10 marks)

Or

(b) Explain the following types of d.c. generators.

    (i) Separately-excited.

    (ii) Self-excited.

(4 + 6 = 10 marks)

[2 × 10 = 20 marks]

Section 2 (Basics of Electronics and Communication Engineering)

PART A

Answer all questions.

1. How are amplifiers broadly classified ?   (2 marks)
2. Define amplitude modulation.   (2 marks)
3. What is the range of microwave frequency ?   (1 mark)

PART B

Answer any two questions.

4. Draw and explain the circuit of cascaded amplifier.   (5 marks)
5. Explain the principle of actuator.   (5 marks)
6. What is meant by hand off ? Explain.   (5 marks)

[2 × 5 = 10 marks]

PART C

Answer all questions.

7. (a) (i) Explain the basic concept of oscillator.   (5 marks)

    (ii) Explain the significance of input impedance, output impedance and frequency response of an amplifier.

(5 marks)

Or

(b) (i) Explain the principle of digital voltmeter.   (7 marks)

    (ii) Explain why NAND and NOR gates are called universal gates ?   (3 marks)

8. (a) Draw the block diagram of superheterodyne receiver and explain the function of each block.

(10 marks)

Or

(b) Draw the block diagram of Optical communication system and explain the function of each block.

(10 marks)

[2 × 10 = 20 marks]