C 15010

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Name....................................

Reg. No.................................

COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, MAY 2011

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

(2009 admissions)

Time : Three Hours

Maximum : 70 Marks

Section 1 (Basics of Electrical Engineering)

Part A

Answer all questions.

1. Define Magnetomotive force.   (2 marks)

2. What is meant by ideal transformer ?   (2 marks)

3. Define peak factor.   (1 mark)

Part B

Answer any two questions.
Each question carries 5 marks.

4. State explain Lenz's law.

5. Calculate the active and the reactive components of the current in each phase of a star-connected, 5000 V, 3-phase alternator supplying 3000 kW at a power factor of 0.8.

6. Derive the e.m.f. equation of a transformer.

$(2 \times 5 = 10 \text{ marks})$

Part C

Answer all questions.
Each question carries 10 marks.

7. (a) (i) Two coils A and B are coupled together, coil A having 400 turns and coil B 600 turns. When 5A flows in coil A, a flux of 5 mWb links with coil B. Calculate the self-inductance of coil A and the mutual inductance between the two coils.   (6 marks)

    (ii) Compare electric and magnetic circuits.   (4 marks)

Or

   (b) (i) Explain the following terms :—

        (1) Frequency ; (2) Average value ; (3) Power factor.

                                                                                      (6 marks)

    (ii) A resistance of 10 Ω is connected in series with an inductance of 0.05 H and a capacitance of 300 μF to a 100 V supply. Calculate the value and phase angle of the current when the frequency is 50 Hz.   (4 marks)

Turn over

8. (a) (i) Explain construction details of d.c. generator.   (5 marks)

      (ii) Explain any one application of d.c. motors.   (5 marks)

Or

(b) (i) Explain the principle of operation of cylindrical rotor type synchronous generator.

          (5 marks)

      (ii) Explain about the basic structure of a.c. power system.   (5 marks)

[2 × 10 = 20 marks]

Section 2 (Basics of Electronics and Communication Engineering)

Part A

Answer **all** *questions.*

1. Define Voltage gain and power gain.   (2 marks)

2. What is the advantages of CMOS logic ?   (1 mark)

3. Define angle modulation.   (2 marks)

Part B

Answer any **two** *questions.*
Each question carries 5 marks.

4. Explain open-loop and closed-loop systems.

5. Explain the principle of RADAR.

6. Explain the principle of light transmission through fibre.

          (2 × 5 = 10 marks)

Part C

Answer **all** *questions.*
Each question carries 10 marks.

7. (a) (i) Explain the principle of electronic amplifier.   (4 marks)

      (ii) Explain the effects of negative feedback.   (3 marks)

      (iii) Write a brief note on noise in an amplifier.   (3 marks)

Or

(b) (i) Explain what is meant by universal gates.   (3 marks)

      (ii) Explain the principle of ADC with block diagram.   (7 marks)

8. (a) (i) Draw the block diagram of FM transmitter and explain each block in detail.   (6 marks)

      (ii) What are the advantages of FM over AM ?   (4 marks)

Or

(b) (i) Draw the block diagram of pulsed RADAR and explain.   (5 marks)

      (ii) Write short note on GPRS technology.   (5 marks)

[2 × 10 = 20 marks]