

**COMBINED FIRST AND SECOND SEMESTER B.TECH. (ENGINEERING)
DEGREE EXAMINATION, MAY 2010**

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

(2009 admissions)

Time : Three Hours

Maximum : 70 Marks

Answer all questions in Part A, any two from Part B and all from Part C.

Section I (Basics of Electrical Engineering)

Part A

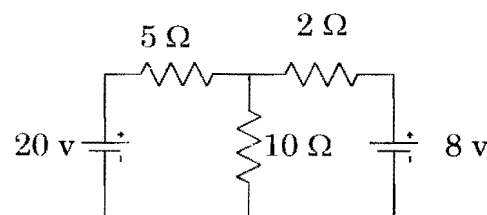
Answer all questions.

1. A coil of 500 turns is linked by a flux of 0.4 mWb. If the flux is reversed in 0.01 second, find the e.m.f. induced in the coil. (2 marks)
2. What are the advantages and disadvantages of induction motors? (2 marks)
3. A resistance of 12 Ω , an inductance of 0.15 H and a capacitor of 100 μF are connected in series across a 100 V, 50 Hz supply. Calculate the impedance. (1 mark)

Part B

Answer any two questions.

4. Using Kirchhoff's law, find the current through 10 Ω resistor.



5. Derive EMF equation of d.c. generator.
6. Explain the principle operation of synchronous generator.

(2 × 5 = 10 marks)

Part C

7. (a) (i) State and explain Faraday's laws electromagnetic induction. (5 marks)
(ii) Compare electric and magnetic circuits. (5 marks)

Or

Turn over

- (b) (i) Derive form factor and peak factor of a sine wave. (5 marks)
- (ii) Three coils, each of resistance 6Ω and inductive reactance 8Ω are joined in delta across 400 V, 3-phase lines. Calculate the line current and power absorbed. (5 marks)
8. (a) Explain the construction and principle of operation single-phase transformer.

Or

- (b) (i) Explain the construction details of d.c. generator.
- (ii) Explain the principle of operation of induction motor. (10 marks)

Section II (Basics of Electronics and Communication Engineering)

Part A

Answer all questions.

1. What are the advantages and disadvantages of negative feedback ? (2 marks)
2. Write RADAR range equation. (1 mark)
3. What is meant by frequency reuse technique ? (2 marks)

Part B

Answer any two questions.

4. Explain briefly about various noises in amplifier.
5. Simplify the following Boolean expression and implement using only NAND gates :

$$Y = \bar{A}\bar{B}\bar{C} + \bar{A}B\bar{C} + A\bar{B}\bar{C} + ABC.$$

6. Explain the principle of GSM. (2 × 5 = 10 marks)

Part C

7. (a) (i) Explain the concept of differential amplifier. (5 marks)
- (ii) Compare TTL and CMOS logic. (3 marks)
- (iii) List the characteristics of OP-AMP. (2 marks)

Or

- (b) Explain the working of CRO with neat block diagram. (10 marks)
8. (a) Draw the block diagram of superheterodyne receiver and explain. (10 marks)

Or

- (b) (i) Explain the basic principle of cellular communications. (5 marks)
- (ii) Write short note on GPRS technology. (5 marks)