Seat No.

Total No. of Pages : 3

OCT-NOV 2025 WINTER EXAMINATION

12609 Bachelor of Technology (NEP-2.1)

Sub. Name: Basic Electrical Engineering

Sub. Code: 114850

Day and Date: Friday ,23-01-2026 **Total Marks: 60**

Time: 10:30 AM To 12:30 PM

Instructions: **1. Use of Scientific calculator is allowed**

Special Inst.: **1. Question No.:-1 is compulsory.**
2. Attempt any THREE questions from Question No. 2 to 5

Q1) Solve following MCQ. **[6]**

i. Kirchhoff's Current Law (KCL) is based on the principle of conservation of
- A. Energy
- B. Charge
- C. Momentum
- D. Mass

ii. Magnetic Flux Density (B) is defined as:
- A. Flux per unit area (B = Ø/A)
- B. MMF per unit length
- C. Total magnetic lines
- D. Strength of the magnet

iii. The Form Factor of a pure sinusoidal waveform is:
- A. 1.0
- B. 1.414
- C. 1.11
- D. 0.707

iv. What is the phase displacement between the three phases in a 3-phase supply?
- A. 90 degrees
- B. 180 degrees
- C. 120 degrees
- D. 60 degrees

v. The core of a transformer is laminated to reduce:
- A. Hysteresis Loss
- B. Eddy Current Loss
- C. Copper Loss
- D. Friction Loss

vi. ELCB stands for: A. Electrical Line Circuit Breaker
- A. Electrical Line Circuit Breaker
- B. Earth Leakage Circuit Breaker
- C. Earth Line Current Breaker
- D. Emergency Load Control Breaker

Q2) Answer the following questions **[18]**

a. Define the terms in DC- E.M.F, Potential Difference, Current, Resistance. **[6]**

b. Two batteries A & B are connected in parallel to supply a load resistance of 10 ohms. Battery A has an EMF of 50V with an internal resistance of 1 ohm & battery B has an EMF of 70V with an internal resistance of 1 ohm. Determine the current delivered by each battery & current in the load resistance. Also calculate power supplied to 10 ohm resistance. Use Node analysis. **[6]**

c. Distinguish between Electric & Magnetic circuit. **[6]**

Q3) Answer the following questions. **[18]**

a. Define- i) Form Factor ii) Peak factor iii) Average Value iv) RMS Value **[6]**

b. Explain three phase Star & Delta connections with their line & phase quantities. **[6]**

c. A R-L series is connected across 250 volts, 50 Hz AC supply, Draws a current of 10 A at 0.8 lagging power factor. Find- (i) Impedance (ii) Resistance (iii) Inductance. **[6]**

Q4) Answer the following questions. **[18]**

a. Explain construction & working principle of single phase transformer. **[6]**

b. Comment on MCB & ELCB. Also state its advantages, disadvantages and applications. **[6]**

c. A 30 KVA 3300/230 Volt single phase 50 Hz transformer has full load copper loss 500 watts & iron loss 300 watts. Calculate transformer efficiency at full load & also at half load, when power factor is 0.866 lagging. **[6]**

Q5) Answer the following questions. **[18]**

a. Explain how single-phase sinusoidal voltage is generated in AC. **[6]**

b. Derive the mathematical expression for RMS value of sinusoidal AC by analytical method. **[6]**

c. Write a short note on Domestic energy bill. **[6]**

End Of Question Paper

Important Note for Chief Exam Officer / SRPD Coordinator / Sr Supervisor/ Student -
This Question Paper may be distributed for following Subjects as common code.
सदरची प्रश्नपत्रिका खालील विषयांकरिता वितरित करता येईल.

1] (12609) Bachelor of Technology (NEP-2.1) (114850) Basic Electrical Engineering Part 1 SEM 1