

Department of Computer Science & Engineering  
School of Engineering Sciences & Technology  
JAMIA HAMDARD  
New Delhi-110062

Odd semester Examination-2024

**Course Name:** Basic Electrical Engineering  
**Subject Code:** BTSCE /BTECE/BTCSEAI -103 (Backlog)

**Time:** 2 Hours 30 Minutes  
**Maximum Marks:** 60

**Section-A (Attempt all questions: (4 x 5 marks = 20 Marks)**

| Q.No | Questions                                                                                                                           | Marks | CO  | BL  |
|------|-------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-----|
| Q1.  | Explain the following terms:<br>1. Alternating current 2. Waveform 3. Angular velocity 4. Instantaneous value<br>5. Effective value | 5     | CO1 | BL1 |
| Q2.  | Derive an expression for RMS value of sinusoidal waveform.                                                                          | 5     | CO2 | BL2 |
| Q3.  | Differentiate between hard magnetic material and soft magnetic material                                                             | 5     | CO3 | BL3 |
| Q4.  | Derive an expression for resonance frequency in series RLC circuit                                                                  | 5     | CO4 | BL5 |

**Section-B (Attempt any four questions: (4 x 10 Marks = 40 Marks)**

| Q.No | Questions                                                                                                                                                                                                                                     | Marks | CO  | BL  |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-----|-----|
| Q1.  | Explain Kirchhoff current and voltage law. For the given below circuit find the voltage $V_1$ and $V_2$ and determine also current at $5\Omega$ resistance by using nodal analysis.                                                           | 10    | CO1 | BL3 |
|      |                                                                                                                                                                                                                                               |       |     |     |
| Q2.  | What is an auto transformer? Discuss its merits and demerits over a two winding transformer.                                                                                                                                                  | 10    | CO3 | BL1 |
| Q3.  | Explain in details the construction and working operation of synchronous generators.                                                                                                                                                          | 10    | CO4 | BL2 |
| Q4.  | A 220 V, 50Hz is applied to a coil of 0.8H inductance and $2\Omega$ resistance connected in series with $5.8\mu\text{F}$ capacitor. Calculate current, Impedance, Phase angle, Power factor, Active power, reactive power and apparent power. | 10    | CO2 | BL4 |
| Q5.  | Draw the B-H curve. Differentiate between hysteresis loss and eddy current loss.                                                                                                                                                              | 10    | CO4 | BL3 |
| Q6.  | Write short notes on any two:<br>(1) Types of wires and cables (2) Types of batteries and their characteristics<br>(3) Earthing and grounding (4) Switch fuse unit                                                                            | 10    | CO5 | BL1 |