

BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-I Computer Science & Business Systems : SUMMER : 2025
SUBJECT: PRINCIPLES OF ELECTRICAL ENGINEERING

Day : Friday
Date : 16/05/2025

S-27624-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Assume suitable data **WHEREVER** necessary.
- 4) Draw neat diagrams **WHEREVER** necessary.
- 5) Use of non-programmable calculator is allowed.

- Q.1** Define and write down the unit of following terms : (10)
i) Work ii) Power iii) Energy iv) Current v) Resistance.
- OR**
- Q.1** Explain the concept of ideal voltage source and practical voltage source. State and explain Kirchhoff's laws in detail. (10)
- Q.2** Discuss and formulate the following equations : (10)
i) Equations to convert star connected resistive network into equivalent delta connected network.
ii) Equations to convert delta connected resistive network into equivalent star connected network.
- OR**
- Q.2** State and explain following theorems : (10)
i) Thevenin's theorem ii) Norton's theorem iii) Superposition theorem
iv) Maximum power transfer theorem.
- Q.3** Define and write down the unit of following terms : (10)
i) Active power ii) Reactive power iii) Apparent power iv) Impedance
v) Admittance.
- OR**
- Q.3** A series R-L circuit with $R = 100 \Omega$ and $L = 0.4 \text{ H}$ is connected to 250 V, 50 Hz source. Estimate : i) Impedance ii) Current iii) Power factor iv) Active power v) Sketch vector diagram. (10)
- Q.4** Define battery and write down different types of battery. Explain construction and working of Lead-acid cell. (10)
- OR**
- Q.4** Define electrostatic field and electric field strength. Derive an expression for equivalent capacitance when two capacitors are connected in series and in parallel. (10)
- Q.5** Define transformer and discuss its principle of operation. Derive an expression for EMF induced in single-phase transformer. (10)
- OR**
- Q.5** State and explain Faraday's law of electromagnetic induction and explain B-H curve of magnetic material. (10)
- Q.6** Sketch and explain basic layout of distribution system. List out different types of earthing system and different types of wiring system. (10)
- OR**
- Q.6** List out different types of lamps and explain Sodium vapour lamp in detail. (10)
