

BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - I Computer Science & Business Systems : WINTER: 2025
SUBJECT: PRINCIPLES OF ELECTRICAL ENGINEERING

Day : Friday
Date : 12/12/2025

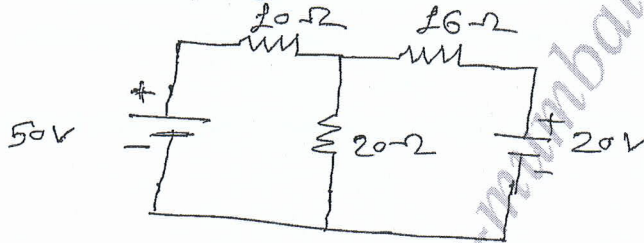
W-24132-2025

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) Draw neat and labelled diagram **WHEREVER** necessary.
- 4) Assume suitable data if necessary.
- 5) Use of non - programmable **CALCULATOR** is allowed.

- Q.1** State and explain Kirchoff's laws. Find the current flowing through $20\ \Omega$ resistance by using Kirchoff's laws. (10)



OR

- Q.1** Define and write down the units of following terms: (10)
- i) EMF ii) Voltage iii) Current iv) Work v) Resistance

- Q.2 a)** Write down the statement of thevenin's theorem and Norton's theorem. (05)

- b)** What is the statement of maximum power transfer theorem? Derive the condition for maximum power transfer to the load. (05)

OR

- Q.2** Explain the concept of Superposition theorem. Derive the formula for conversion of star to delta connection for resistive circuit. (10)

- Q.3** Sketch AC waveform. Define the following terms related to AC waveform: (10)
- i) Frequency ii) Cycle iii) Waveform iv) Time period v) Amplitude
vi) Peak factor vii) Form factor

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OR

Q.3 a) Draw power triangle and explain the concept of active power, reactive power and apparent power. (05)

b) Define and write down the unit of impedance and admittance. What is the relation between line and phase values of voltage and current in star connected system? (05)

Q.4 a) Define the following terms: (05)

- i) Electric flux ii) Electric flux density iii) Electric field intensity
iv) Absolute permittivity v) Relative permittivity

b) State the equation for calculation of equivalent capacitance when capacitors are connected in series? Derive the expression for energy stored in capacitor. (05)

OR

Q.4 Define and classify battery. Explain the concept of Nickel-Metal Hydride battery in detail. (10)

Q.5 a) Define the following terms related to magnetic circuit: (05)

- i) Magneto motive force ii) Reluctance iii) Permeance iv) Reluctivity
v) Self inductance

b) State and explain Faraday's law of electromagnetic induction. (05)

OR

Q.5 Define efficiency and voltage regulation related to performance of transformer. Explain direct load test to determine efficiency and voltage regulation of single phase transformer. (10)

Q.6 List out different types of lamps. Explain Sodium vapour lamp in detail along with its construction, advantages and disadvantages. (10)

OR

Q.6 Sketch basic layout of distribution system. List out different types of wiring system and explain cleat wiring in detail. (10)

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