

BACHELOR OF TECHNOLOGY (CBCS - 2023)

B. Tech. Sem-I COMPUTER SCIENCE & BUSINESS SYSTEMS : SUMMER : 2024

SUBJECT: PRINCIPLES OF ELECTRICAL ENGINEERING

Day : Wednesday

Date : 15/05/2024

S-27624-2024

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 diagrams **WHEREVER** necessary.
- 4) Use of non - programmable **CALCULATOR** is allowed.
- 5) Assume suitable data if necessary.

Q.1 Explain the concept of ideal voltage source and practical voltage source in detail. Compare EMF and potential difference. (10)

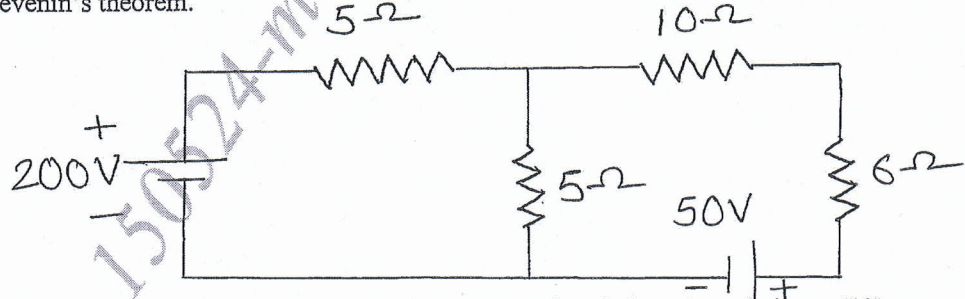
OR

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

Q.2 State and explain maximum power transfer theorem. Derive the condition for maximum power transfer for the resistive circuit. (10)

OR

Q.2 Write down the statement of Superposition theorem and Thevenin's theorem. Find current flowing through $6\ \Omega$ resistance in following circuit by using Thevenin's theorem. (10)



Q.3 Formulate the equations to convert delta connected resistive network into equivalent star connected network. (10)

OR

Q.3 a) Sketch power triangle and define active power and reactive power. (04)

b) A series R-L circuit with $R=25\ \Omega$ and $L=0.1\text{H}$ is connected to 250V, 50 Hz Source. Calculate: i) Impedance ii) Current iii) Power factor (06)

Q.4 List out different types of batteries. Explain construction, working principle and applications of Lead-acid battery. (10)

P.T.O.

OR

Q.4 Develop the expression for energy stored in capacitor. Define and write down the unit of the following terms: (10)
i) Electric flux ii) Electric flux density iii) Permittivity

Q.5 Discuss principle of operation of single-phase transformer and derive the expression for EMF induced in single-phase transformer. (10)

OR

Q.5 Explain B-H curve for magnetic material. Discuss the concept of self inductance and mutual inductance in short. (10)

Q.6 Explain following concepts in short: (10)
i) Different types of wiring system
ii) Different types of earthing
iii) List of safety devices
iv) Transducer
v) Sensor

OR

Q.6 List out different types of lamps and explain sodium vapour lamp in detail. (10)

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