BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)

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

SUBJECT: PRINCIPLES OF ELECTRICAL ENGINEERING

Day : Tuesday
Date : 14/05/2024

S-24132-2024

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

N.B.

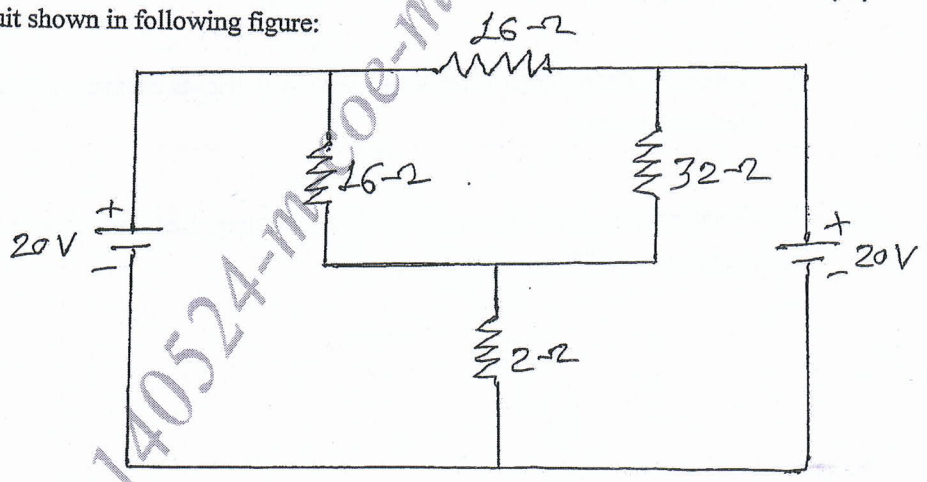
1) All questions are **COMPULSORY.**
2) Figures to the **RIGHT** indicate **FULL** marks.
3) Assume suitable data **WHEREVER** necessary.
4) Draw neat labeled diagrams **WHEREVER** necessary.
5) Use of non-programmable calculator is allowed.

Q.1 State and explain Kirchhoff's laws. Explain concept of ideal current source and practical current source in detail. **(10)**

OR

Q.1 a) Define resistance and discuss the factors affecting resistance value. **(05)**

b) Using Kirchhoff's laws, calculate the current flowing in 2 Ω resistance for the circuit shown in following figure: **(05)**



Q.2 State and explain Thevenin's theorem and Maximum power transfer theorem. Derive the condition for maximum power transfer for the resistive circuit. **(10)**

OR

Q.2 Derive the formula for star to delta conversion and delta to star conversion for resistive circuit. **(10)**

Q.3 Sketch AC waveform and define the following terms related to AC circuit: **(10)**
i) Cycle ii) Time period iii) Frequency iv) Peak value

OR

Q.3 Sketch power triangle. Explain the concept of resonance in series R-L-C circuit and derive the formula for resonant frequency. **(10)**

P.T.O.

Q.4 Two condensers of 30 μF and 60 μF are connected in series across 200 V D.C. supply. Find i) Equivalent capacitance ii) The charge on each condenser iii) Potential difference across the condensers. **(10)**

OR

Q.4 Classify electric batteries. Discuss construction, working and applications of Nickel- Cadmium cell. **(10)**

Q.5 State and explain Faraday's law of electromagnetic induction. Compare magnetic circuit and electric circuit. **(10)**

OR

Q.5 Derive E.M.F. equation of single-phase transformer and explain direct load test method to determine efficiency and voltage regulation of single-phase transformer. **(10)**

Q.6 a) Define transducer and sensor. What are the basic requirements of good quality transducer? **(05)**

b) List-out different types of earthing system and discuss necessity of earthing in electrical system. **(05)**

OR

Q.6 Sketch and explain basic layout of distribution system. List-out different types of wiring system and different types of lamps. **(10)**

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