BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-I Computer Science & Business Systems : WINTER : 2024
SUBJECT: PRINCIPLES OF ELECTRICAL ENGINEERING

Day : Tuesday
Date : 10/12/2024

W-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.

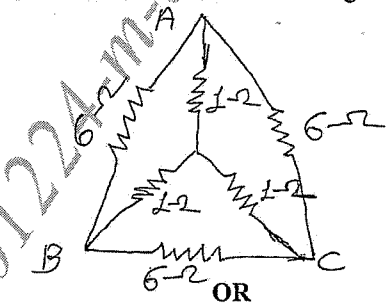
Q.1 **a)** Define EMF and resistance. Discuss the factors affecting resistance value. **(05)**

b) Calculate resistance of 50 m length of aluminum wire having uniform cross sectional area of 0.05 mm^2 and having resistivity of 50 $\mu\Omega$-cm. If the wire is drawn four times of it's original length, calculate value of new resistance. **(05)**

OR

Q.1 State and explain Kirchhoff's laws. Define and write down the unit of following terms: **(10)**
i) Work ii) Power iii) Energy

Q.2 Write down the statement of Superposition theorem and Thevenin's theorem. Calculate the value of resistance R_{BC} in following circuit by using star/delta transformation. **(10)**



OR

Q.2 Write down the statement of Maximum power transfer theorem and Norton's theorem. Derive the condition for maximum power transfer for the resistive circuit. **(10)**

Q.3 Sketch and explain power triangle. Elaborate the concept of resonance in series R–L–C circuit. **(10)**

OR

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

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 Derive the expression for equivalent capacitance for following condition: **(10)**

i) Capacitors are connected in series.

ii) Capacitors are connected in parallel.

Q.5 Explain Faradays law of electromagnetic induction and discuss the following concepts in short: **(10)**

i) Self inductance ii) Mutual inductance iii) Coefficient of coupling

OR

Q.5 Define transformer and discuss in short the following concepts related to operation of single phase transformer: **(10)**

i) Voltage regulation ii) Efficiency iii) EMF equation iv) Losses in transformer

Q.6 List out different types of wiring system and wiring accessories. Explain cleat wiring in detail. **(10)**

OR

Q.6 Discuss necessity of earthing. List out different types of earthing and explain rod earthing in detail. **(10)**

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