BACHELOR OF TECHNOLOGY (C.B.C.S.) (2021-COURSE)

B. Tech. Sem - I Computer Science & Business System : WINTER- 2022

SUBJECT : PRINCIPLES OF ELECTRICAL ENGINEERING

Day : Friday | Time : 10:00 AM-01:00 PM

Date : 13-01-2023 | W-24132-2022 | 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 Define and write down the units of : **(10)**

i) EMF
ii) Current
iii) Potential Difference
iv) Resistance
v) Work

OR

a) An electric kettle supplied from 230 V D.C. supply is required to heat 1 kg of water from 40^0 C to boiling point in 10 minutes. If the efficiency of the bottle is 80 %, calculate the resistance of the heating element of the kettle. The specific heat of water is 4180 J/kg. **(05)**

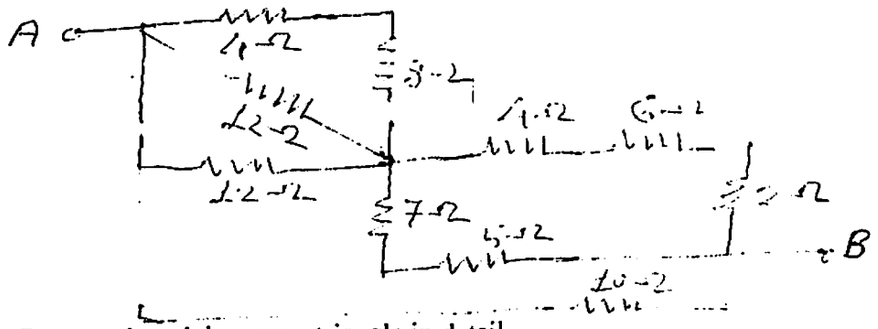
b) State and explain Kirchoff's current and voltage law. **(05)**

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

OR

a) Derive the equations to convert delta connected resistive network into equivalent star connected network. **(06)**

b) Calculate net resistance between terminals A and B. **(04)**



Q. 3 **a)** Draw and explain power triangle in detail. **(05)**

b) A series R–L circuit with R = 50 Ω and L = 0.2 H is connected to 250 V, 50 Hz source. Calculate: **(05)**

i) Impedance
ii) Current
iii) Power factor
iv) Active power
v) Draw vector diagram

P. T. O.

OR

a) Sketch A.C. waveform and define the following terms related to A.C. circuit: **(05)**

i) Form factor
ii) Peak factor
iii) Impedance
iv) Admittance

b) Explain the concept of resonance in series R-L-C circuit in short. **(05)**

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

i) Electrostatic field
ii) Electric field strength
iii) Electric flux
iv) Electric flux density
v) Permittivity

b) Three capacitors of values $4\mu F$, $8\mu F$ and $12\mu F$ value have an applied voltage of 120 V across their series combination. Determine the voltage on each of the capacitors. **(05)**

OR

Define battery and list out its different types. Explain construction and working of lead-acid battery in detail and also discuss different applications of lead-acid battery. **(10)**

Q. 5 a) State and explain Faraday's law of electromagnetic induction. **(05)**

b) Define transformer and explain different types of losses in single phase transformer. **(05)**

OR

a) Compare magnetic circuit and electric circuit. **(05)**

b) Discuss B-H curve for magnetic material in short. **(05)**

Q. 6 a) Sketch and explain basic layout of distribution system. **(05)**

b) Define earthing and discuss the importance of earthing in electrical system. **(05)**

OR

List out different types of wiring system. Explain cleat wiring in detail along with its advantages, limitations and applications. **(10)**

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