Paper code – U117 – 104B (T1)

Total No. of Questions – [4]   Total No. of Printed Pages 2

G.R. No.

SEPTEMBER 2017 / IN - SEM (T1)

F. Y. B.TECH. (COMMON) (SEMESTER - I)

COURSE NAME : BASIC ELECTRICAL ENGINEERING

(2017 PATTERN)

Time : [1 Hour]   [Max. Marks : 30]

(*) Instructions to candidates:
1) Answer Q.1 OR Q.2, Q.3 OR Q.4
2) Figures to the right indicate full marks.
3) Use of scientific calculator is allowed
4) Use suitable data where ever required

Q 1)   a) Obtain the equations to convert three given delta connected resistances R_{12}, R_{23} and R_{31} into its equivalent star circuit with circuit diagram.
[6]

b) State Thevenin's theorem and explain the steps to find V_{Th}, R_{eq}. and load current I_L.
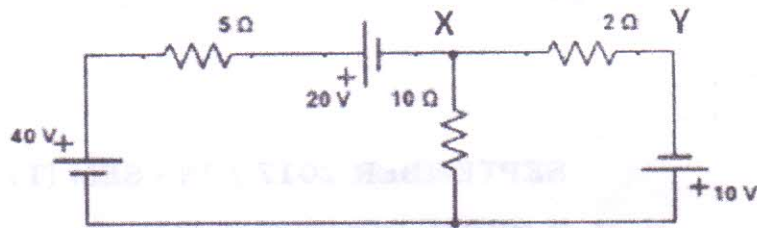[6]

c) Using Kirchhoff's laws, calculate current flowing through 5 Ω in given circuit.
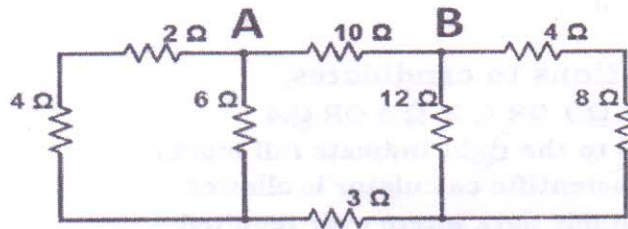[4]
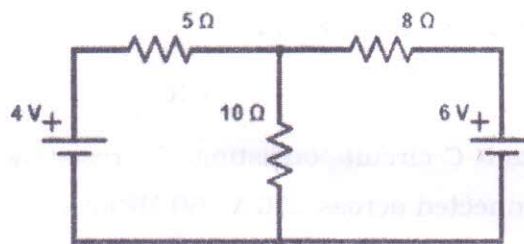
OR

Q2)   a) State and explain Kirchhoff's laws.
[6]

b) Using superposition theorem, find current flowing through 2 Ω resistance for the network shown.
[6]

c) Find equivalent resistance between A and B for the network shown in the figure below. [4]

Q3) a) A coil having resistance of 20 Ω and an inductance of 0.1 H is connected to 200 V, 50 Hz supply. Calculate:- (i) circuit current (ii) phase angle (iii) Power factor (iv) power consumed (v) voltage drop across resistance and inductance [6]

b) Prove that current in purely inductive circuit lags applied voltage by 90°. [4]

c) Draw impedance triangle, write formula for impedance and phase angle and nature of p.f. for series R-C circuit. [4]

OR

Q4) a) A series R-C circuit consisting of a resistance of 50 Ω and a capacitor of 100 μF is connected across 230 V, 50 Hz ac supply, calculate: i) Impedance ii) Power factor iii) Current. Draw phasor diagram. [6]

b) Define with reference to alternating quantities varying sinusoidally i) Form factor ii) Peak factor. Obtain their values for sinusoidal waveform. [4]

c) Prove that current in purely capacitive circuit leads applied voltage by 90°.[4]

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