G.R. No.

Paper Code - U128-107 (T1)

MARCH 2019 / IN-SEM (T1)

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

COURSE NAME: BASIC ELECTRICAL ENGINEERING

COURSE CODE: ET 10182A

(PATTERN 2018)

Time: [1 Hour]   [Max. Marks: 20]

(*) Instructions to candidates:
1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed.**
4) **Use suitable data where ever required.**
5) **Assume suitable data, if required.**

Q 1)   Attempt any **two**.
  a) Using Superposition theorem, find the current flowing through 3Ω resistance for the network shown in fig.1.   [4]
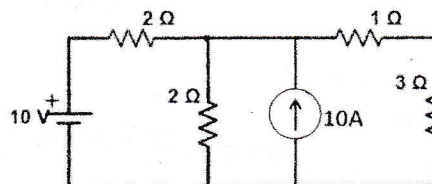

Fig.1

  b) Using Thevenin's theorem, find the current flowing through 3Ω resistance for the network shown in fig.1.   [4]

  c) State and explain in brief Kirchhoff's laws.   [4]

Q 2)   Attempt any **two**.
  a) A circuit consists of a resistance of 4Ω, inductance of 0.5H and a variable capacitance in series across 100 V, 50 Hz ac supply. Calculate: i) the value of capacitance required to produce series resonance ii) current flowing at resonance iii) Voltage across resistance and capacitance at resonance.   [4]

  b) Prove that current in purely inductive circuit lags behind the applied voltage by 90⁰ if it is connected across an ac voltage source of v = $V_m \sin \omega t$ Volts.   [4]

c) Derive with the help of a neat phasor diagram, an expression showing the relationship between line current and phase current in case of a three phase balanced delta connected load which has a lagging power factor and connected across a symmetrical three phase ac supply. [4]

Q 3) Attempt any **one**.
  a) 80 KVA, 3200/400 V, 50 Hz, single phase transformer has 111 turns on its secondary. Calculate: - i) number of turns on primary winding
    ii) primary and secondary full load current
    iii) cross sectional area of the core if the maximum flux density is 1.2 Wb/mm^2. [4]

  b) State any two significant advantages and applications of a single phase autotransformer. [4]