1458

Code : 15EE-21T

II Semester Diploma Examination, April/May-2016
ELECTRICAL CIRCUITS

Time : 3 Hours]   **[Max. Marks : 100**

*Note :*   (i)   Answer any **Six** questions from Part-A. Each questions carries 5 marks.

         (ii)   Answer any **Seven** questions from Part-B. Each full questions carries 10 marks.

PART - A

1. Define Node, Linear circuit and Active circuit.   **5**

2. List and explain the electrical circuit elements.   **5**

3. Define : (i) flux (ii) reluctance, Write their units.   **5**

4. State and explain Faraday's laws of electromagnetic induction.   **5**

5. Explain the mid-ordinate method of calculating the RMS. Value of an alternating voltage and current.   **5**

6. Draw the sinusoidal waveform and mark peak value, time period & cycle of an alternating quantity.   **5**

7. Draw the circuit diagrams waveform and vector diagram for pure inductive circuit.   **5**

8. Define :
   (i)   leading power factor
   (ii)   lagging power factor
   (iii)   unity power factor
   With vector diagram   **5**

9. Write the relationship between line voltage, line current, phase voltage, phase current in three phase star and delta connected system, with circuit diagram.   **5**

PART - B

10. (a) State and explain Kirchoff's voltage laws.   5

    (b) For the circuit shown below find the magnitude of current through an ammeter 'A'. Applying Kirchoff's voltage law.   5
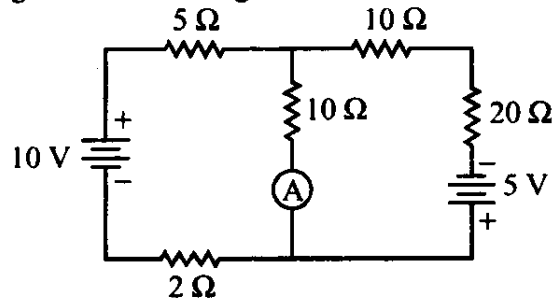
11. For the network shown below determine :

    (i) Total circuit resistance (ii) Total circuit current

    Using Y – Δ transformation   10
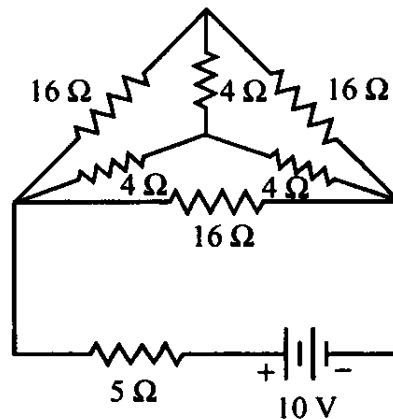
12. (a) State the superposition theorem and explain.   5

    (b) Find the current through the load resistance 'RL' in the circuit shown below by applying Thevenin's theorem.   5
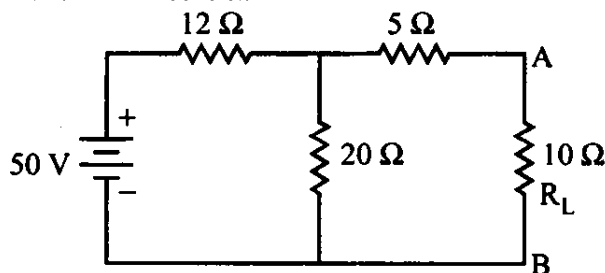
13. (a) (i) State the law of reluctance

        (ii) Define magnetizing force and mention it's unit.   5

    (b) Compare magnetic circuit and electric circuit.   5

14. (a) Explain dynamically induced emf and statically induced emf.   6
    (b) Define : (i) Self Inductance (ii) Mutual Inductance   4

15. (a) A coil of 50 cms length and 2 sq-cm area of cross section has 1500 turns on it.
        Find the inductance of the coil when the core is iron of μr = 800   5
    (b) Define the following with respect to alternating quantity.
        (i)   Instantaneous value
        (ii) Amplitude
        (iii) Frequency
        (iv) Cycle   5

16. (a) Define : (i) Average value (ii) Form factor
        And write the equations.   5
    (b) An alternating current is represented as i = 0.707 sin 400 t.
        Find : (i) RMS value (ii) Frequency (iii) Current
        When, t = 0.002 secs after passing through zero in the +ve direction.   5

17. (a) Find the form factor of an alternating quantity current which has maximum
        value of 1.5 Amps.   5
    (b) Derive an equation for power consumed in a pure resistive circuit.   5

18. (a) Explain RLC – series circuit with neat circuit diagram, waveform and vector
        diagram.   5
    (b) A resistance 5 Ω and an inductance of 0.1 Henry are connected in series across
        200 V 50 Hz AC supply, find :
        (i) Impedance (ii) current in the circuit   5

19. (a) Explain the condition for series resonance and draw the resonance curve.   5
    (b) Three impedances (5+j4) are connected in STAR across 440 V, 3 ϕ 50 Hz AC
        supply. Calculate :
        (i)   Phase current
        (ii) Line current
        (iii) Power factor
        (iv) Power consumed   5

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