372 Register No.:

November 2022

Time – Three hours
(Maximum Marks: 100)

[N.B. 1. Answer all questions under Part-A each question carries 3 marks.
2. Answer all the questions either (A) or (B) in Part-B each question carries 14 marks.]

PART – A

1. Define specific resistance and state its unit.

2. Obtain an expression for the equivalent resistances of three resistors R1, R2, R3 which are connected in parallel.

3. Define:(i) Network (ii) Node (iii) Branch.

4. List any three theorems used for network analysis.

5. Define average value and RMS value of A.C. quantity.

6. Define the terms: (i) Form factor (ii) Peak factor.

7. What is meant by phase sequence?

8. Show that the line voltage in a balanced star connected system is $\sqrt{3}$ times of phase voltage.

9. Define primary cell and secondary cell. Give example.

10. List the applications of lead acid battery.

[Turn over.....

PART - B

11. (a) (I) Three capacitors have capacitance of 4μf, 6μf and 8μf respectively. Find the total capacitance when they are connected (a) in series (b) in parallel.

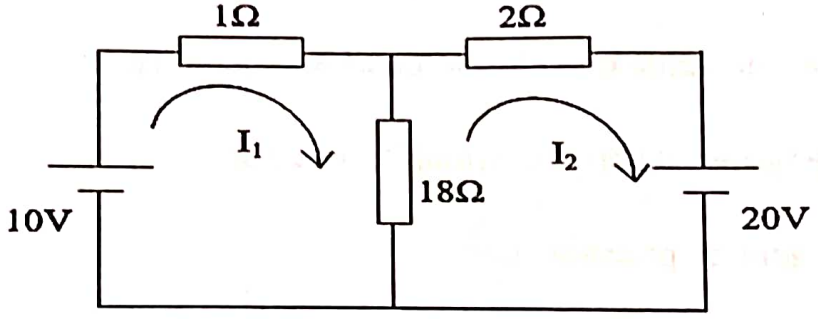
(II) A 100W, 250 Volts lamp is connected in series with a 100W, 200 Volts lamp across a 250 Volts supply. Find the value of current flows through the lamp and voltage across each lamp.

(Or)

(b) (i) A circuit consists of two resistors 20 Ω and 30 Ω cco onnected in parallel. They are connected in series with a resistor of 15 Ω. If the current through 15 Ω resistor is 3 amps findd the current in the other resistors, total voltage and total power.

(ii) Two capacitors each of 3μf and 4μf are connectteed in series across 100V d.c supply. Calculate (i) the voltage across each capacitor (ii) the energy stored across each capacitor and (iii) the equivalent capacitance of the combination.

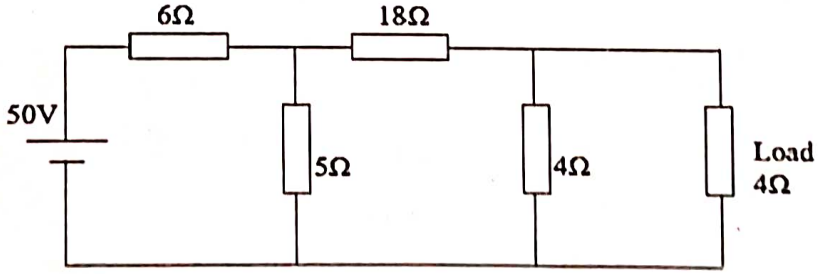
12. (a) (i) Find the current through 18 Ω resistor in the givenn circuit using mesh current analysis.



(ii) State Thevenin's theorem.

(Or)

(b) (i) Find the current through 4Ω load resistor using mmeesh current analysis.



(ii) State Superposition theorem.

13. (a) (i) Derive an expression for average value of a.c quantity in terms of maximum value.

(ii) Find the impedance, current and phase angle of the series circuit having a resistance of 10Ω and inductance of 10 millihenry. The applied voltage is 200V, 50Hz.

(Or)

(b) (i) The equation for a voltage is written as E = 100 sin 314 t. Find a) frequency b) maximum value c) average value d) RMS value and e) voltage at time 1/200 s after passing first zero.

(ii) Derive an expression for the impedance in RL series circuit.

14. (a) (i) A balanced delta connected load of (8+j6) ohms per phase is connected to a 3 phase 230V supply. Find the line current, power factor, power and total volt ampere.

(ii) Draw the diagram of 3 phase power measurement by two wattmeter method.

(Or)

(b) (i) The readings of the two watt meters used to measure power in a capacitive load are 3000W and 8000W respectively. Calculate (a) the input power and (b) the power factor at the load.

(ii) Define positive sequence and negative sequence.

15. (a) Explain the construction and working of lead acid battery.

(Or)

(b) Explain the chemical reactions and physical changes during discharging and charging of lead acid cell.
