

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – ELECTRONICS

ELECTRIC CIRCUITS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Give the SI unit of resistivity.
(i) ohm/metre² (ii) ohm metre²
(iii) ohm metre (iv) ohm/metre
- 2 The maximum power is delivered from a source to its load when the load resistance is _____ the source resistance.
(i) greater than (ii) less than
(iii) equal to (iv) less than or equal to
- 3 The number of cycles a wave completes in one second is called _____.
(i) Time period (ii) frequency
(iii) Energy (iv) wavelength
- 4 What is maximum value of power factor?
(i) 0.5 (ii) 1 (iii) 1.5 (iv) 0.95
- 5 In a balanced three-phase system-delta load, if we assume the line voltage is $V_{RY} = V \angle 0^\circ$ as a reference phasor. Then the source voltage V_{BR} is?
(i) $V \angle 120^\circ$ (ii) $V \angle 240^\circ$ (iii) $V \angle -240^\circ$ (iv) $V \angle -120^\circ$

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a. State Ohm's law.
OR
b. An Electric iron is rated 1000W, 240V. Find the current drawn & resistance of the heating element.
7. a. State the Maximum Power Transfer Theorem.
OR
b. Distinguish mesh and node analysis.
8. a. An alternating voltage is given by $V=230\sin 314t$. Calculate i) frequency, ii) maximum value, iii) average value, iv) RMS value
OR
b. Analyze what happens when a capacitor and resistor are connected in parallel.
- 9 a Draw the phasor diagram of RLC circuit.
OR
b Narrate which circuit is determined by the frequency of LC tank circuit?
- 10 a Sketch and compare single phase and 3 phase system.
OR
b Sketch the Phasor diagram of two wattmeter method when the load is used as inductive load.

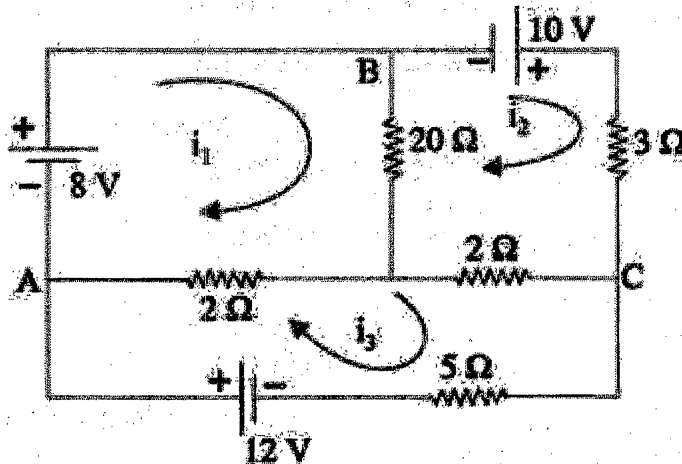
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SECTION -C (30 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks

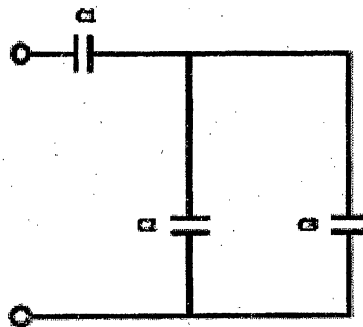
(5 x 6 = 30)

11.a. Calculate current in 5ohm resistor by any one method.

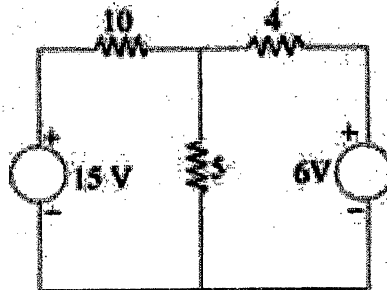


OR

b. Examine the function of the total equivalent capacitance.


 $C_1=5F, C_2=7F, C_3=1F$

12 a. State Thevenin's theorem and give a proof. Apply this theorem to calculate the current through the 4Ω resistor of the given circuit of Fig.



OR

b. Summarize the steps to solve the super position theorem.

13 a. Highlight the three characteristics of a sine wave X.

OR

b. Justify why current in an inductor vary in terms of phase angle with the voltage across it?

14 a. Derive the total potential difference of series RLC circuit.

OR

b. Examine why LRC circuit capacitance is changed from C to 5C for the resonant frequency to remain unchanged, the inductance should be changed from L to Value L/5?

15 a. Three loads, each of resistance 50Ω are connected in star to a 400 V, 3-phase supply. Determine (a) the phase voltage, (b) the phase current and (c) The line current.

OR

b. Discuss how the power is measured in 3 -phase circuits?

Z-Z-Z

END