PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(First Semester)

Branch – **ELECTRONICS**

ELECTRIC CIRCUITS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What is the unit of Capacitance? (a) Volts (b) Amperes (c) Farads (d) Henrys	K1	CO1
	2	Compute the voltage drop across a 20 Ω resistor when a current of 2A passes through it (a) 20 V (b) 40 V (c) 12 V (d) 8 V	K2	CO1
2	3	What does a Norton's equivalent circuit consist of? (a) A current source in parallel with a resistor (b) A current source in series with a resistor (c) A voltage source in series with a resistor (d) A current source only	K1	CO2
	4	Show how many mesh equations are needed for a planar circuit with 3 meshes? (a) 1 (b) 2 (c) 3 (d) 4	K2	CO2
3	5	What does Vm represents in equation V=Vm Sin(ωt) ? (a) Average voltage (b) RMS voltage (c) Peak voltage (d) Instantaneous voltage	K1	CO3
	6	How many degree is equal to one radian? (a) 57.3 (b) 57.8 (c) 57.4 (d) 57.5	K2	CO3
4	7	What is the unit used to measure reactive power in AC circuits. (a) Watt (b) Volt-Ampere (c) VAR (d) Joule	K1	CO4
	8	Show the condition for resonance in a series resonance circuit. a) $X_L = X_C$ (b) $X_L > X_C$ (c) $X_L < X_C$ (d) $X_L = 0$	K2	CO4
5	9	What is the Phase difference between each phase in a 3-phase system? (a) 120 degrees (b) 140 degrees (c) 240 degrees (d) 100 degrees	K1	CO5
	10	Show the Indian standard AC voltage rating. (a) 110V 60Hz (b) 230V 50Hz (c) 110V 50Hz (d) 230V 60Hz	K2	CO5

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SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain about pure Inductance parameter and Show that the energy stored in it is ½ LI^2.	K2	CO1
		(OR)		
	11.b.	Explain KCL and KVL.		
2	12.a.	Organize and explain the Maximum Power Transfer Theorem.	K3	CO2
		(OR)		
	12.b.	Organize and explain the Superposition Theorem.		
3	13.a.	Determine the values of Peak factor and Form factor for a sinusoidal waveform.	K3	CO3
		(OR)		
	13.b.	Sketch the phasor diagram of a series RC circuit and explain it.		
4	14.a.	Analyze and derive an expression for instantaneous power in an AC circuit and explain how average power is calculated.	K4	CO4
		(OR)		
	14.b.	Examine the Q-Factor of a series RLC circuit and discuss how Q –Factor affects the bandwidth of the circuit.		
5	15.a.	List out the advantages of three phase system.	K4	CO5
		(OR)		
	15.b.	Examine the generation of three phase voltage with neat diagram and explain it.		

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Examine and derive equations for converting the delta network to star network.	K4	CO1
2	17	List out the steps to Thevinize a given circuit and explain it with suitable example.	K4	CO2
3	18	Examine and determine the equation to find R.M.S value & Average value of a sine wave.	K4	CO3
4	19	Analyze a parallel resonance circuit and derive an equation for its resonance condition.	K4	CO4
5	20	Derive the expression for Total Power in a Three-Phase System Using the Two Wattmeter Method.	K4	CO5

Z-Z-Z END