PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2025
(First Semester)

Branch - CHEMISTRY

BASIC ELECTRONICS FOR CHEMISTS

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	Tell, what is the unit of resistance? a) Volt b) Ampere c) Ohm d) Watt	K1	CO1
	2	Show, what are the two main types of transistors? a) PNP and NPN b) Analog and Digital c) Bipolar and Unipolar d) Diode and Resistor	K2	CO1
2	3	Which of the following components is essential for the functioning of an inverting amplifier? a) Capacitor b) Inductor c) Operational Amplifier d) Transformer	K1	CO2
	4	Classify the primary function of an astable multivibrator. a) To produce a single pulse b) To generate a square wave signal c) To switch between two states d) To amplify a signal	K2	CO2
3	5	Find which logic gate outputs true only when both of its inputs are true? a) OR Gate b) AND Gate c) NOT Gate d) NAND Gate	K1	CO3
	6	How many inputs does a full adder have? a) 2 b) 3 c) 4 d) 5	K1	CO3
4	7	Choose a binary up and down counter. What signal typically controls the counting direction? a) Reset signal b) Clock signal c) Direction control signal d) Enable signal	K1	CO4
	8	Tell in a 4-bit ring counter, how many unique states can it represent? a) 4 b) 8 c) 16 d) 2	K1	CO4
5	9	What is the primary function of a potentiometer? a) To amplify signals b) To measure voltage c) To vary resistance and adjust voltage d) To store electrical energy	K1	CO5
	10	Show which part of the spectrophotometer is responsible for separating light into its component wavelengths? a) Detector b) Sample holder c) Light source d) Monochromator	K2	CO5

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.	Construct and explain the operation of a half- wave rectifier.	K3	CO1
		(OR)		
	11.b.	Identify the concepts of transistor biasing.		
2	12.a.	Show the principle of non-inverting amplifier.	K2	CO2
		(OR)		
	12.b.	Summarize about solar cell and their applications.		
3	13.a.	Compare the concepts of NAND and NOR gates with their truth table.	K4	CO3
		(OR)		
	13.b.	Classify the purpose of the RS flipflop.		
4	14.a.	Explain the working principle of decade counters.	K5	CO4
		(OR)		
	14.b.	Assess the concepts of the D/A converter: Weighted resistor.		
5	15.a.	List of the principle of ammeter.	K4	CO5
		(OR)		
	15.b.	Assume the value and explain the method of atomic absorption spectroscopy.		

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	Discover the characteristics of the Zener diode, including forward and reverse bias regions, and explain the significance of each region.	K4	CO1
2	17	Construct and explain the working principle of the monostable multivibrator.	K3	CO2
3	18	Examine the main role of the four-bit binary adder.	K4	CO3
4	19	Compare the working concepts of synchronous and asynchronous counters.	K5	CO4
5	20	Identify the role of a photoelectric colorimeter and explain its advantages.	K5	CO5

Z-Z-Z   END