

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**MSc DEGREE EXAMINATION MAY 2025
(First Semester)**

Branch – ENVIRONMENTAL SCIENCE

INSTRUMENTATION METHODS FOR ENVIRONMENTAL SAMPLES

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	In an experiment, it is found that the experimental value is very close to actual value, hence the experimental value can be called _____ a) Accurate b) Precise c) Suitable d) Mean	K1	CO1
	2	_____ lens of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed a) Eyepiece b) Objective c) Condenser d) Magnifying	K2	CO1
2	3	The electrolyte solution within the glass electrode of the pH meter is _____ a) Saturated KCl b) Conc. HCl c) dil. KCl d) dil. HCl	K1	CO2
	4	Which of the following factors does not influence electrophoretic mobility? a) Molecular weight b) Shape of molecule c) Size of molecule d) Stereochemistry of molecule	K2	CO2
3	5	Which of the following wavelength ranges is associated with visible spectroscopy? a) 0.9-500 μm b) 410-99 nm c) 390-740 nm d) 0.02-9 nm	K1	CO3
	6	The locations of air quality monitoring stations depend on _____ a) Stack height b) Wind speed c) Wind direction d) Rainfall	K2	CO3
4	7	Which of the following equipment is not used to collect particulates in industries? a) Gravity settlers b) Electrostatic precipitators c) Absorbers d) Cyclone separators	K1	CO4
	8	In chromatography, the stationary phase can be _____ supported on a solid. a) Solid or liquid b) Liquid or gas c) Solid only d) Liquid only	K2	CO4
5	9	Which of the following substances cannot be emitted by radioactive substances during their decay? a) Protons b) Neutrinos c) Helium nuclei d) Electrons	K1	CO5
	10	Which of the following acts as quenching gas in Geiger Muller counter? a) Alcohol b) Argon gas c) Krypton d) Hydrogen	K2	CO5

Cont...

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.	How Experimental Errors are classified? How it can be minimized/ Explain in brief.	K3	CO1
	(OR)			
	11.b.	Differentiate SEM with TEM in terms of instrumentation and applications.		
2	12.a.	Define Potentiometry. Explain its Instrumentation and measurement methods.	K4	CO2
	(OR)			
	12.b.	Comment on different types of water samplers.		
3	13.a.	Describe the basic principle and instrumentation of UV Visible spectrophotometer.	K3	CO3
	(OR)			
	13.b.	Give a brief account on Beta attenuation method for particulate matter measurement.		
4	14.a.	Briefly explain about turbidimetry and gravimetry techniques.	K4	CO4
	(OR)			
	14.b.	Comment your views on the role of AI in water and air pollution in monitoring.		
5	15.a.	Mention the types of radiations along with its properties and applications in brief.	K5	CO5
	(OR)			
	15.b.	Comment on the applications of isotopes in biological and environmental studies.		

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	Explain the principle, instrumentation and applications of fluorescent microscope.	K4	CO1
2	17	Explain the principles and applications of different types of electrophoresis.	K4	CO2
3	18	Discuss on the instrumentation and applications of ICP MS.	K5	CO3
4	19	How air pollutants from Industrial Stack are monitored and measured in real time? Explain in detail.	K4	CO4
5	20	Give a detailed account on Scintillation Counter and GM Counters.	K5	CO5