

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2023
(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	A type of error in measurements or observations that is consistent, predictable, and tends to shift all measurements in a regular manner away from the true value is known as a) Random error b) Systematic error c) Stochastic error d) Indeterministic error	K1	CO1
	2	Extraction is a _____ process. a) Separation b) Mixing c) Boiling d) Combining	K2	CO2
2	3	Method of collecting a single sample or multiple samples at a specific point in time from a source is known as a) Composite sampling b) Passive sampling c) Grab sampling d) Convenience sampling	K1	CO3
	4	Electrophoresis is a technique used to _____ molecules. a) separate b) condense c) mix d) vaporize	K2	CO3
3	5	In a spectrophotometer, cuvette is used for a) holding the sample b) changing the wavelength c) changing the path of light d) creating electric field	K1	CO3
	6	For identification and characterization of the crystal structure of materials, which of the following technique is used? a) Spectrophotometry b) Flame Photometry c) Bomb Calorimeter d) X-ray diffraction	K2	CO4
4	7	Nephelometry is used for determining a) turbidity of water samples b) hardness of water samples c) total dissolved solids of water samples d) color of water samples	K1	CO4
	8	Which of the following is used to measure wind speed? a) Anemometer b) Barometer c) Hygrometer d) Pyranometer	K2	CO4
5	9	Radiation consisting of 2 protons and 2 neutrons is known as a) alpha radiation b) beta radiation c) gamma radiation d) UV radiation	K1	CO5
	10	Isotopes are elements having a) same number of protons and different number of electrons b) same number of neutrons and same number of electrons c) same number of neutrons and different number of protons d) same number of protons and different number of neutrons	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.	Distinguish between precision and accuracy with a suitable example.	K4	CO1
		(OR)		
	11.b.	Classify the types of errors.		
2	12.a.	List the steps involved in using a pH meter.	K4	CO2
		(OR)		
	12.b.	Contrast voltammetry and conductometry based on their principle and applications.		
3	13.a.	Explain the principle of Raman Spectroscopy and its applications in environmental analysis.	K5	CO3
		(OR)		
	13.b.	Explain the principle of flame photometry and its applications in environmental analysis.		
4	14.a.	List the meteorological instruments needed for air pollution monitoring.	K4	CO4
		(OR)		
	14.b.	List the applications of chromatography in environmental analysis.		
5	15.a.	Distinguish between alpha radiation and beta radiation.	K5	CO5
		(OR)		
	15.b.	Explain the principle of Geiger Muller Counter.		

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	Compare the light microscopy and electron microscopy and their applications.	K4	CO2
2	17	Explain in detail the types of water samplers and method of sampling water in each type.	K4	CO1
3	18	Elaborate continuous monitoring of atmospheric pollutants in the atmosphere.	K4	CO3
4	19	Justify the usage of Artificial Intelligence in environmental monitoring.	K5	CO4
5	20	Elaborate the role of isotopes in biological and environmental studies.	K5	CO5

Z-Z-Z

END