22ESP105N/22ESP105

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2024
(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	When measured values are close to each other consistently, it is called a) Accuracy b) Precision c) Deviation d) Random Error	K1	CO1
	2	A systematic process of adjusting and verifying the accuracy of a device by comparing with standards is known as a) Calibration b) Adjustment c) Validation d) Comparison	K2	CO1
2	3	The equation which describes the relationship between the electrochemical potential and the concentration of ions in the solution is known as a) Arrhenius equation b) Gibbs equation c) Nernst equation d) Henderson equation	K2	CO2
	4	In conductivity meter ____ is used to measure the conductivity of a sample. a) Conductivity cell b) Conductivity electrode c) Glass electrode d) Reference electrode	K1	CO2
3	5	Spectrophotometry is a technique based on a) Absorption of light b) Reflection of light c) Absorption of heat d) Emission of heat	K2	CO2
	6	Sodium and Potassium in water / soil samples are be determined by a) X-ray diffraction b) Spectrophotometry c) Bomb Calorimeter d) Flame Photometry	K1	CO4
4	7	Turbidity of water sample is determined by a) Nephlometry b) Calorimetry c) Conductometry d) Potentiometry	K1	CO4
	8	Anemometer is used to measure _____. a) Wind Speed b) Atmospheric Pressure c) Humidity d) Incoming radiation	K2	CO4
5	9	Alpha radiation consists of a) 2 protons and 2 neutrons b) 2 protons and 2 electrons c) 2 neutrons and 2 electrons d) 2 positrons and 2 neutrinos	K1	CO5
	10	The elements having same number of protons and different number of neutrons are known as a) Isomers b) Isotherms c) Isobars d) Isotopes	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.	Recommend strategies for minimization of errors.	K5	CO1
	(OR)			
	11.b.	Recommend appropriate microscopy technique for analyzing geological and environmental samples.		
2	12.a.	Compare a pH meter with ion selective electrode method .	K4	CO2
	(OR)			
	12.b.	How does a sound level meter function?		
3	13.a.	Contrast UV visible spectrophotometer with Atomic Absorption Spectrophotometer.	K4	CO3
	(OR)			
	13.b.	List the applications of FTIR.		
4	14.a.	Compare the principle of operations of GC-MS with LC-MS.	K4	CO4
	(OR)			
	14.b.	List the types of gas analyzers used in air pollution monitoring.		
5	15.a.	Relate carbon dating for environmental analysis.	K4	CO5
	(OR)			
	15.b.	Contrast particle radiation with wave radiation.		

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 principles and applications of two types of extraction processes in environmental sample analysis.	K5	CO1
2	17	Elaborate the principle and applications of electrophoresis technique in environmental analysis.	K6	CO2
3	18	Explain the principles and applications of (i) XRD (ii) EPR	K5	CO3
4	19	Elaborate the principle and applications of the instruments used in analysis of water samples.	K6	CO4
5	20	Compare the types of radiation detectors – their principle and applications in the field of environmental analysis.	K5	CO5

Z-Z-Z END