Total number of printed pages: 02 **U/7/UIE711**

2022

ANALYTICAL INSTRUMENTATION

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

Part-A: Answer all questions

1. a) …… source is used in IR spectrophotometer.

   b) Argon is used as ..... in gas chromatograph.

   c) ……. spectrometer is a non-destructive technique, which uses ionizing radiation for the sample analysis.

   d) Enzyme is the ..... of biosensor.

   e) …… is the stationary phase in partition chromatograph.

   f) …… is the substance which produces light in the visible or near UV range, when it absorbs ionizing radiation or particle.

   g) ……. is used for sulphur detection in gas chromatograph.

   h) ……. is the commonly used solid scintillator.

   i) …….. is a non-destructive technique for finding the structure of molecules in a liquid.

   j) The stationary phase is kept in the ……of a chromatograph.

   k) ..... is used as measuring electrode in pH meter.

   l) …… counter does not differentiate the ionizing radiations or particles coming into it.

   m) …… source is used in NMR spectrometer.

   n) …….. detector produces electron hole pair when an ionizing radiation or particle enters it.

   o) Quadrupole mass spectrometer uses …….. voltage source in it.

   p) …….. is used for aromatic hydrocarbon detection in GC.

   q) …… membrane electrode is selective for ammonia.

r) …….. scintillators are used for low energy β particles.

s) …….source is used in the PID of GC.

t) ……. ISE is used for water hardness measurement. 1*20=20

Part-B: Answer any four questions

2.	a)	With a neat block diagram, explain the working of GC.	8
	b)	With neat diagrams, explain FPD and ECD used in GC.	12
3.	a)	Describe a technique to detect SO_2 pollutant in air.	6
	b)	Explain any two types of ionizing radiation or particle detector.	14
4.	a)	Describe an ISE technique for measuring hydrogen ion concentration in urine.	4
	b)	Describe ISE and its types.	6
	c)	Explain the construction and working of XRF spectrometer.	10
5.	a)	Describe the fluorescent detector used in LC.	6
	b)	Explain any two types of mass spectrometer.	14
6	a)	Explain the construction and working of NMR spectrometer.	10
	b)	With neat diagrams, explain atomic absorption spectrophotometer.	10

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