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Question Paper Code: 55505

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fifth Semester

Electronics and Instrumentation Engineering

(Common to Instrumentation and Control Engineering)

01UEI505 – ANALYTICAL INSTRUMENTS

(Regulation 2013)

Duration: 1:15hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The units of an IR spectrometer on the X-axis is
 - (a) meter
 - (b) centimeter
 - (c) per meter
 - (d) per centimeter
2. Wave number of near infrared spectrometer is
 - (a) 12500 - 4000
 - (b) 4000 - 200
 - (c) 200 - 10
 - (d) 200 - 20
3. If the concentration of solution increases, then the absorption_____
 - (a) remains same
 - (b) decreases
 - (c) increases
 - (d) unpredictable
4. In gas chromatography, the basis for separation of the components of the volatile material is the difference in
 - (a) partition coefficients
 - (b) conductivity
 - (c) molecular weight
 - (d) molarity
5. Which gas has high thermal conductivity?
 - (a) Nitrogen
 - (b) Hydrogen
 - (c) Helium
 - (d) Carbon dioxide

6. The principal source of volatile organics (Hydrocarbons) is
- (a) Transportation (b) Industrial processes
(c) Stationary fuel combustion (d) Volcanoes
7. _____ is an electrode which responds to change in the activity of the analyte ion.
- (a) Calomel electrode (b) Hydrogen electrode
(c) Indicator electrode (d) Ion selective electrode
8. If the pH value of the solution is 5, what will be the concentration of H⁺ ions
- (a) 10^{-0.2} gm/lit (b) 10⁻⁵ gm/lit
(c) 0.2 gm/lit (d) 10⁻⁵ gm/lit
9. Scintillators are chemicals used to convert
- (a) chemical energy to radiant energy (b) radiant energy to light
(c) radiant energy to chemical energy (d) light to radiant energy
10. The primary signal of an NMR spectrum is called
- (a) signal (b) Fourier Transformation
(c) FID (d) Laplace Transformation

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Illustrate the working principle of double beam IR spectrophotometers. (8)
12. Describe the operation of flame ionization detector in detail. (8)
13. Summarize the working principle of any one type of Oxygen (O₂) gas analyser. (8)
14. With neat diagram, explain the construction and working of dissolved oxygen analyzer. (8)
15. Explain the working of a Scanning Electron Microscope (SEM) with neat sketch. (8)