

Reg.No. _____



Karunya UNIVERSITY

(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

End Semester Examination – Nov/Dec – 2016

Code : 14BI2002
Sub. Name : INSTRUMENTAL METHODS OF ANALYSIS

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

Q. No.	Questions				Course outcome	Marks
PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)						
1.	Henderson’s equation can be represented by				CO2	
	a. $\text{pH} = \text{pK}_a + \log (\text{Salt})/(\text{Acid})$	b. $\text{pH} = \text{pK}_a - \log (\text{Acid})/(\text{Salt})$	c. $\text{pK}_a = \text{pH} + \log (\text{Salt})/(\text{Acid})$	d. $\text{pK}_a = \text{pH} - \log (\text{Salt})/(\text{Acid})$		(1)
2.	What substances are present in a buffer?				CO2	
	a. A weak base or acid and its salt	b. A hydrolyzing salt only	c. A weak base only	d. A salt only		(1)
3.	pH range is in between				CO2	
	a. 7-14	b. 0-14	c. 1-14	d. 1-7		(1)
4.	pH meter was invented by				CO2	
	a. Arnold Orville Beckman in 1909	b. Arnold Orville Beckman in 1934	c. Sørensen in 1909	d. Sorenson in 1934		(1)
5.	Which of the following is not used as reference electrode?				CO2	
	a. Glass electrode	b. Hydrogen electrode	c. Calomel electrode	d. Silver electrode		(1)
6.	Buffering action of haemoglobin is mainly due to its				CO2	
	a. Histidine residues	b. Glutamine residues	c. Arginine residues	d. Lysine residues		(1)
7.	A photon whose wavelength is 510 nm is				CO1	
	a. an ultraviolet photon	b. a visible photon	c. an infrared photon	d. a microwave photon		(1)
8.	Wavelength visible to naked eye is				CO1	
	a. 190-700 nm	b. 400-700 nm	c. 200-900 nm	d. 340-700 nm		(1)

9.	Flame photometer is equipment used for detection of				CO1	
	a. Sodium and Potassium	b. Sodium and Manganese	c. Sodium and Magnesium	d. Potassium and Magnesium		(1)
10.	The light source of Ultra Violet radiation in spectrophotometer is				CO1	
	a. Deuterium lamp	b. Tungsten filament lamp	c. Halogen lamp	d. Deuterium and halogen lamp		(1)
11.	Monochromator used in UV Visible spectrophotometer is				CO1	
	a. Glass filters	b. Grating or Prism	c. Mirrors	d. Half Mirrors		(1)
12.	C.V.Raman was awarded Nobel Prize in the year				CO1	
	a. 1931	b. 1930	c. 1929	d. 1928		(1)
13.	The detector used in colorimeter is				CO1	
	a. Photovoltaic cell	b. Photomultiplier	c. Mirror	d. Half Mirror		(1)
14.	Path length of the cuvettes used in spectrophotometer is				CO1	
	a. 1 cm	b. 2 cm	c. 3 cm	d. 1.5 cm		(1)
15.	Infrared spectroscopy provides valuable information about				CO1	
	a. Molecular weight.	b. Melting point.	c. Conjugation	d. Functional groups		(1)
16.	In infrared spectroscopy which frequency range is known as the fingerprint region?				CO1	
	a. $4000 - 3000\text{cm}^{-1}$	b. $2500 - 2000\text{cm}^{-1}$	c. $2000 - 1500\text{cm}^{-1}$	d. $1500 - 750\text{cm}^{-1}$		(1)
17.	The radioimmunoassay technique is based on the principle of				CO1	
	a. isotope dilution	b. Conjugation	c. Binding	d. Complex formation		(1)
18.	In IR spectroscopy Applied IR frequency should be equal to the _____				CO1	
	a. Magnetic frequency	b. Positive frequency	c. Negative frequency	d. Natural frequency		(1)
19.	_____ stretching vibrations followed in IR spectroscopy				CO1	

	a. Wagging	b. Scissoring	c. Symmetric	d. Rocking		(1)
20.	What is the most common source and sample holder used in atomic emission spectroscopy?				CO1	
	a. Laminar flow burner	b. Direct current plasma	c. Electro thermal atomization furnace	d. Inductively coupled plasma		(1)
21.	What is sedimentation coefficient?				CO3	
	a. Sedimentation rate per unit of centrifugal field	b. Sedimentation rate of centrifugal field	c. Sedimentation rate per minute of centrifugal field	d. Sedimentation rate per part of centrifugal field		(1)
22.	Vertical tube rotors are also called as				CO3	
	a. Fixed zero angle rotors	b. Fixed angle rotors	c. Fixed rotors	d. Fixed vertical angle rotors		(1)
23.	What do you mean by isopycnic point?				CO3	
	a. Density of particle equals density of medium	b. Density of particle is greater than density of medium	c. Density of particle smaller than density of medium	d. Density of particle slightly higher than density of medium		(1)
24.	Theodor Svedberg invented analytical ultracentrifuge in the year				CO3	
	a. 1925	b. 1928	c. 1935	d. 1930		(1)
25.	What is Rf?				CO3	
	a. Retardation factor	b. Reflection factor	c. Revolution factor	d. Rescreening factor		(1)
26.	Nuclear medicine was developed in the 1950s by physicians with an endocrine emphasis, initially using _____ to diagnose and then treat thyroid disease				CO3	
	a. Iodine-131	b. Strontium-89	c. Rhenium-186	d. Samarium 153		(1)
27.	Phosphorus-32 is used in the treatment of _____				CO3	
	a. Brain, thyroid, lungs and also in liver, spleen, kidney	b. Red blood cells and quantifies gastro-intestinal protein loss	c. Treatment of cancer	d. Polycythemia vera and as Beta emitter		(1)

28.	Life time of Chromium -51 is				CO3	
	a. 28d	b. 8d	c. 74d	d. 17d		(1)
29.	Palladium-103 is used to make brachy therapy permanent implant seeds for.				CO3	
	a. Cancer treatment	b. Head and breast cancer	c. Treat thyroid disease	d. Early stage prostate cancer		(1)
30.	Iridium-__ and palladium-__ is used as an internal radiotherapy source for cancer treatment and to make brachy therapy permanent implant seeds, which among the following isotopes are used for both?				CO3	
	a. 192 and 103	b. 131 and 103	c. 103 and 32	d. 213 and 192		(1)
31.	Atoms of a given element with different mass numbers are called as				CO3	
	a. Radioactive decay	b. Isotopes	c. Electrons	d. Protons		(1)
32.	The mechanisms of Argon gas in GM counter central tube				CO3	
	a. Ionisation	b. Conductivity	c. High voltage ion scattering	d. Electron Simulation		(1)
33.	Emulsions consist of silver halide crystals suspended in a clear phase composed mainly of				CO3	
	a. Beta particles	b. Radionuclides	c. G-ray	d. Gelatin		(1)
34.	Differential scanning calorimetry (DSC) is a technique to measure _____				CO3	
	a. Electrical conductivity	b. Impact energy	c. Thermal expansion	d. Specific heat		(1)
35.	Which of the following is not a UNIT of heat				CO3	
	a. Fehranhit	b. Joule	c. Calorie	d. British thermal Unit		(1)
36.	_____ is the mode of heat transfer that occurs when there is a temperature gradient across the body				CO3	
	a. Convection	b. Radiation	c. Conduction	d. All of the above		(1)
37.	Differential scanning calorimetry (DSC) is a technique useful in determining				CO3	
	a. glass transition	b. softening points	c. melting point of	d. all of the above		(1)

	temperatures	of amorphous polymers and glasses	a crystalline polymer			
38.	Which method would be used to measure both the heats and temperatures of transitions and reactions?				CO3	
	a. DSC	b.DTA	c.TGA	d.TMA		(1)
39.	Temperature in DTS and DSC is measured using				CO3	
	a. thermocouples	b. capacitors	c. resistors	d. aluminium wires		(1)
40.	The detectors used in Scintillation counter				CO3	
	a. PMT	b.PVC	c. Electron pulser	d. Thermal detector		(1)

PART B (8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)

41.	Write short note on Glass electrode	CO2	(5)
42.	Write the principle applications of colorimeter	CO1	(5)
43.	Give a brief account on differential centrifugation	CO3	(5)
44.	Give a short note on Affinity chromatography	CO1	(5)
45.	Briefly explain about agarose gel electrophoresis	CO1	(5)
46.	Mention different types of Radioactive decay	CO3	(5)
47.	Write short note on Isoelectric focussing	CO1	(5)
48.	Give a brief account on Autoradiography	CO3	(5)
49.	Write briefly about DTA	CO3	(5)
50.	What is thermo gravimetric analysis?	CO3	(5)

PART C(2 X 10 = 20 MARKS) (ANSWER ANY TWO)

51.	Explain in detail about the principle, working protocol and applications of pH meter with a neat diagram	CO2	(10)
52.	Describe the working principle, apparatus and applications of Raman Spectroscopy	CO1	(10)
53.	Write in detail about principle, working procedure and applications of Scintillation counter in detection of radioactive isotopes	CO3	(10)

ALL THE BEST