

Competitive M.Sc. Examination
Analytical Chemistry & Advanced Instrumentation

Q\ Choose the correct answer for the following:

- 1- The First step of Laser is:
a) Spontaneous emission b) Stimulated emission c) Pumping
d) Absorption
- 2- Fragmentation process involved in:
a) Mass Spectroscopy b) X-ray c) IR d) TGA
- 3- IR involved two steps used to:
a) Estimate the M.wt of molecule b) Identify the functional group of molecule
c) Separation of biological macromolecules
- 4- Gradient elution, two or more solvent systems that differ in polarity are used in:
a) SFC b) GC c) HPLC
- 5- Gel-Permeation chromatography is the newest of LC procedures depended on:
a) Partition b) Adsorption c) Effective size
- 6- Interferences are removed in AAS using:
a) $C_2O_4^{2-}$ b) PO_4^{3-} c) S^{2-} d) SO_4^{2-}
- 7- The second step of mechanism of precipitate formation is,
a) Nucleation b) Aging c) Crystal growth
- 8- The Frequency of microwave radiation is:
a) 2017 MHz b) 1850 MHz c) 2445 MHz d) 1500 MHz
- 9- The resulting of electrophoretic separations is:
a) Fractogram b) Chromatogram c) Electropherogram
d) Thermogram
- 10- In gas chromatography involves:
a) Pressure programming b) Temp. programming c) Gradient elution
- 11- A common feature of modern HPLC instruments, the instantaneous recording of absorption spectra provides, used detector:
a) Fluorescence b) UV-Vis c) Diode array
- 12- The range of x-ray radiation is:
a) (0.1-10 nm) b) (0.2-25 nm) c) (0.5-20 nm) d) (0.3-15 nm)
- 13- Tg in DTA thermogram is the characteristic temperature at which glassy amorphous polymers become flexible or rubber, this transition involves:
a) $\Delta H = -1450 \text{ J}$ b) $\Delta H = -300 \text{ kJ}$ c) $\Delta H = 0$ d) $\Delta H = 1100 \text{ J}$
- 14- Sodium tetraphenylborate is an organic precipitating agent for:
a) Nickel ions b) Potassium ions c) Copper ions d) Calcium ions

15- Some reducing agents employed in gravimetric methods are:

- a) BaCl_2 b) HCl c) $\text{H}_2\text{C}_2\text{O}_4$

16- Eriochrome black T is organic reagent used in:

- a) Spectrophotometric analysis b) Volumetric analysis
c) Solvent extraction system

17- DSC is a thermal technique in while differences in:

- a) Mass b) Heat flow c) Temperature

18- Precision is describes the agreement between two or more measurements, is expressed by:

- a) Rec.% b) Error c) RSD% d) $E_{\text{rel.}}\%$

19- The smallest concentration of material that give a signal equal to the blank signal (Y_B) plus three times of standard deviation ($3SB$) of blank, is called to:

- a) Linearity b) Detection limit c) Reproducibility d) Variance

20- A gas-sensing probe is a galvanic cell whose potential is related to the concentration of:

- a) Liquid b) Gas c) Solid d) Solvent