

Exam Date & Time: 14-Feb-2022 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

VII Semester BPharm - End semester Theory Examinations 2021
PQA BP701T: INSTRUMENTAL METHODS OF ANALYSIS (Theory)

Instrumental Methods of Analysis [PQA-BP701T - S2]

Marks: 75

Duration: 180 mins.

I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

1) Which one of the following molecules show $\pi \rightarrow \pi^*$ transition?

(1)

1) Ethane	2) Ethanol	3) Ethene	4) Formaldehyde
-----------	------------	-----------	-----------------

2) Which one of the following transitions is referred as R- band?

(1)

1) $\pi \rightarrow \pi^*$	2) $\sigma \rightarrow \sigma^*$	3) $n \rightarrow \pi^*$	4) $n \rightarrow \sigma^*$
----------------------------	----------------------------------	--------------------------	-----------------------------

3) What is the absorbance value, when intensity of incident light is 100 and transmitted light is 50?

(1)

1) 0.30	2) -1.00	3) 1.00	4) 0.50
---------	----------	---------	---------

4) Which one of the following statements is incorrect?

1) Electron donating group enhances fluorescence	2) Aliphatic and saturated cyclic organic compound enhances fluorescence	3) High atomic number atom introduced to π electron system decreases fluorescence	4) Increase in temperature decreases fluorescence
--	--	---	---

(1)

5) Which one of the following is the reason for phosphorescence?

1) Singlet excited state to ground singlet state	2) Triplet excited state to ground singlet state	3) Internal conversion	4) Collisional deactivation
--	--	------------------------	-----------------------------

(1)

6) How many fundamental vibrational modes are possible for CO₂ and H₂O? (1)

1) 3 and 6	2) 3 and 4	3) 4 and 6	4) 4 and 5
------------	------------	------------	------------

7) Which type of filter paper is used in paper chromatography

1) Butter paper	2) Sample paper	3) Whatmann filter paper	4) Filter paper
-----------------	-----------------	--------------------------	-----------------

(1)

8) In reverse phase chromatography, the stationary phase is _____

1) Polar	2) Non- Polar	3) Either polar or non- polar	4) Non of these
----------	---------------	-------------------------------	-----------------

9) What is Eluent?

1) Is the nonpolar solvent	2) Is the polar solvent	3) Is a solvent that is used for separation of absorbed material from stationary phase	4) None of the above
----------------------------	-------------------------	--	----------------------

(1)

10) Cation is _____ charged ion, moves towards _____

1) Positively, Cathode	2) Positively, anode	3) Negatively, cathode	4) Negatively, anode
------------------------	----------------------	------------------------	----------------------

(1)

11) Among the following cations, which has the highest ion-exchange capacity?

1) Sodium	2) Aluminium	3) Thorium	4) Calcium
-----------	--------------	------------	------------

12) Which of the following chromatographic technique is the most preferred technique for purification of enzymes?

1) Affinity chromatography	2) Size exclusion chromatography	3) Adsorption chromatography	4) Partition chromatography
----------------------------	----------------------------------	------------------------------	-----------------------------

13) Which of the following GC detector is specific for halogens?

1) Flame ionization detector	2) Electron capture detector	3) Thermal conductivity detector	4) Flame photometric detector
------------------------------	------------------------------	----------------------------------	-------------------------------

(1)

14) Principle of PTGC in Gas Chromatography is based on the principle that: (1)

1) As the temperature of the column increases, analytes comes to the vapour phase easily resulting in reduced retention time.	2) As per the Clasius clapyron equation, as the temperature increases, the vapour pressure decreases resulting in reduced retention time	3) As the temperature increases, the polarity of the column increases.	4) As the temperature increases, the non polarity increases.
---	--	--	--

15) The most commonly used derivatizing agent "BSTFA" is an example for:

1) Alkylating agent	2) Condensation agent	3) Silylating agent	4) Cyclizing agent
---------------------	-----------------------	---------------------	--------------------

- 16) Which of the following HPLC detector is an example of "bulk property detector"?

1) UV-Visible detector	2) Fluorescence detector	3) Electrochemical detector	4) Refractive index detector
------------------------	--------------------------	-----------------------------	------------------------------

- 17) Which of the following electrode is used as working electrode in polarographic experiment?

1) Glass electrode	2) Calomel electrode	3) Silver-Silver chloride electrode	4) Dropping mercury electrode
--------------------	----------------------	-------------------------------------	-------------------------------

- 18) Conducting power of all the ions produced by one mole of the electrolyte in a given solution is called as:

1) Specific conductance	2) Equivalent conductance	3) Molar conductance	4) Molar conductance at infinite dilution
-------------------------	---------------------------	----------------------	---

- 19) Which of the following electrode is used as indicator electrode in a pH meter?

1) Platinum electrode	2) Silver-Silver chloride electrode	3) Glass electrode	4) Calomel electrode
-----------------------	-------------------------------------	--------------------	----------------------

- 20) Which of the following statement is true?

1) Polarographic maxima helps in easy determination of diffusion current and can be achieved by adding surfactants to the electrolyte solution.	2) The presence of dissolved oxygen in a solution can be determined from a polarogram of the solution.	3) In a biamperometric titration of Iodine against sodium thiosulphate, the sudden appearance of current is the end point.	4) The current does not increase in an amperometric titration before the end point, when "only the titrating reagent is electroactive".
---	--	--	---

II Long Answers

Answer all the questions.

- 1) a. Enlist the factors that alter the signal while analyte concentration is kept constant in atomic absorption spectroscopy. (5M) (10)
 b. What is scattering. Enlist the types of scattering with appropriate examples. (5M)
- 2) With the help of a flow diagram, explain the instrumentation requirements of HPLC. (10)

III Short

Answers Answer all the questions.

- 1) a. Why grating monochromators are preferred over prism monochromators in UV visible

- spectrophotometer? (2.5 M) (5)
- b. Explain Czerny turner design of monochromator with a schematic diagram. (2.5 M)
- 2) Explain spectrophotometric titration with examples. (5)
- 3) a. Explain Nujol Mull sample preparation technique. (2.5 M)
b. Explain the working of thermocouple with a schematic diagram. (2.5 M) (5)
- 4) Enlist and explain the types of atomization sources used in atomic emission spectroscopy. (5)
- 5) Explain the principle of liquid - liquid chromatography. Enlist various methods of development techniques in paper chromatography. (5)
- 6) With the help of a diagram explain the construction of dropping mercury electrode. Analyse its advantages as a working electrode in polarography. (5)
- 7) Construct a titration curve for weak acid vs strong base and explain the shape of the curve. (5)

-----End-----