



Practice MCQ For Govt Pharmacist Exam, in this article we will solve, Practice MCQ on the subject Pharmaceutical analysis of first semester. Read following article for your reference.

[Definition and scope](#)

[Different techniques of analysis](#)

[Methods of expressing concentration](#)

[Primary and secondary standards](#)

[Preparation and standardization of various molar and normal solutions](#)

**1.What is the primary goal of pharmaceutical analysis?**

- A) Identifying substances
- B) Determining molecular structures
- C) Investigating drug combinations
- D) All of the above

**2.Which type of chromatography separates components based on size, charge, or hydrophobicity?**

- A) Ion exchange chromatography
- B) Surface adsorption chromatography
- C) Partition chromatography
- D) Size exclusion chromatography

**3.Which technique involves measuring the volume of a titrant that reacts stoichiometrically with the analyte?**

- A) Spectrophotometry
- B) Titrimetry
- C) Chromatography
- D) Mass spectrometry

**4.Raw materials analysis in pharmaceuticals focuses on:**

- A) Assessing the quality of finished products
- B) Evaluating the safety of drug formulations
- C) Ensuring the purity of ingredients

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D) Investigating drug interactions

**5. Which of the following is NOT a titrimetric technique?**

- A) Acid-base titration
- B) Redox titration
- C) Complexometric titration
- D) Gas chromatography

**6. Pharmaceutical analysis covers substances from various sources, including:**

- A) Animals
- B) Plants
- C) Minerals
- D) All of the above

**7. To become a Pharmaceutical Analyst, knowledge in which of the following areas is essential?**

- A) Biology
- B) Chemistry
- C) Physics
- D) All of the above

**8. What is the normality of lead (II) nitrate if the density of its 26% (w/w) aqueous solution is 3.105 g/mL? Take the molar mass of lead (II) nitrate to be 331 g/mol.**

- A) 2.437 N
- B) 4.878 N
- C) 0.243 N
- D) 0.488 N

**9. What is the mole fraction of glycerin ( $C_3H_5(OH)_3$ ) in a solution containing 33 g of glycerin, 60 g of isopropyl alcohol, and the rest water?**

- A) 0.359
- B) 0.258
- C) 0.205

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D) 0.480

**10. If a urea ( $\text{NH}_2\text{CONH}_2$ ) contains 45% (by mass)  $\text{N}_2$ , what is the actual urea content in the sample?**

A) 103.7 kg

B) 96.4 kg

C) 9.65 kg

D) 10.4 kg

**11. Iron (III) oxide chunks contain 80 ppm silica ( $\text{SiO}_2$ ). What is the concentration of this impurity in mass%?**

A) 0.008%

B) 0.080%

C) 0.800%

D) 8.000%

**12. Consider 100 mL of a 0.3 molar solution formed by dissolving 3.33 g of  $\text{XCl}_2$  in water. What is the molar mass of element X? (Atomic mass of Cl = 35.5)**

A) 9

B) 24

C) 40

D) 87

**13. What is the molality of a dilute aqueous 0.02 N  $\text{H}_3\text{PO}_4$  solution?**

A) 0.0050

B) 0.0200

C) 0.00330

D) 0.0067

**14. Calculate the volume (mL) of concentrated acid required to prepare 500 mL of a 0.25 N HCl solution from concentrated stock HCl solution (specific gravity = 1.19) and 37.2% (by mass).**

A) 12.128 mL

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- B) 20.613 mL
- C) 10.307 mL
- D) 24.256 mL

**15. What is the primary purpose of standardizing a solution?**

- A) To determine its color
- B) To improve its stability
- C) To accurately determine its concentration
- D) To make it more reactive

**16. Which of the following substances is commonly used as a primary standard for acid-base titrations?**

- A) Oxalic acid ( $C_2H_2O_4$ )
- B) Sodium hydroxide (NaOH)
- C) Hydrochloric acid (HCl)
- D) Potassium permanganate ( $KMnO_4$ )

**17. What is the molarity of a 15 mL, 2 M aqueous solution when 285 mL of water is added to it?**

- A) 0.400 M
- B) 0.100 M
- C) 0.111 M
- D) 0.105 M

**18. Which of the following indicators is commonly used in acid-base titrations?**

- A) Methyl orange
- B) Phenolphthalein
- C) Bromothymol blue
- D) Litmus

**19. What is the molality of a dilute aqueous 0.02 N  $H_3PO_4$  solution?**

- A) 0.0050

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- B) 0.0200
- C) 0.00330
- D) 0.0067

**20. What is the normality of lead (II) nitrate if the density of its 26% (w/w) aqueous solution is 3.105 g/mL? Take the molar mass of lead (II) nitrate to be 331 g/mol.**

- A) 2.437 N
- B) 4.878 N
- C) 0.243 N
- D) 0.488 N

**21. Which type of chromatography separates components based on size, charge, or hydrophobicity?**

- A) Ion exchange chromatography
- B) Surface adsorption chromatography
- C) Partition chromatography
- D) Size exclusion chromatography

**22. What is the molar fraction of glycerin (C<sub>3</sub>H<sub>5</sub>(OH)<sub>3</sub>) in a solution containing 33 g of glycerin, 60 g of isopropyl alcohol, and the rest water?**

- A) 0.359
- B) 0.258
- C) 0.205
- D) 0.480

**23. Which of the following is NOT a primary standard for standardizing sodium thiosulphate?**

- A) Sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>)
- B) Calcium carbonate (CaCO<sub>3</sub>)
- C) Mercuric oxide (HgO)
- D) Tri-hydroxymethylamino-methane

**24. What is the purpose of using an indicator in a titration?**

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- A) To detect the endpoint
- B) To enhance the color change
- C) To stabilize the solution
- D) To prevent precipitation

**25. Which of the following substances is commonly used as a primary standard for acid-base titrations?**

- A) Oxalic acid ( $C_2H_2O_4$ )
- B) Sodium hydroxide (NaOH)
- C) Hydrochloric acid (HCl)
- D) Potassium permanganate ( $KMnO_4$ )

**26. What is the purpose of standardizing a solution?**

- A) To determine its concentration accurately
- B) To make it more stable
- C) To increase its reactivity
- D) To improve its color

**27. Which of the following is NOT a primary standard for standardizing sodium thiosulphate?**

- A) Sodium carbonate ( $Na_2CO_3$ )
- B) Calcium carbonate ( $CaCO_3$ )
- C) Mercuric oxide (HgO)
- D) Tri-hydroxymethylamino-methane

**28. In the standardization of sodium thiosulphate, what is the role of starch indicator?**

- A) To detect the endpoint
- B) To enhance the color change
- C) To stabilize the solution
- D) To prevent precipitation

**29. Which of the following reactions represents the standardization of hydrochloric acid (HCl) using sodium hydroxide (NaOH)?**

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- A)  $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- B)  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{H}_2\text{O}$
- C)  $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{O}_2$
- D)  $\text{NaOH} + \text{HCl} \rightarrow \text{NaCl} + \text{O}_2$

### Answers

1. The primary goal of pharmaceutical analysis is **all of the above**, including identifying substances, determining molecular structures, and investigating drug combinations.
2. The type of chromatography that separates components based on size, charge, or hydrophobicity is **Size exclusion chromatography**.
3. The technique that involves measuring the volume of a titrant that reacts stoichiometrically with the analyte is **Titrimetry**.
4. Raw materials analysis in pharmaceuticals focuses on **ensuring the purity of ingredients**.
5. The technique that is NOT a titrimetric technique is **Gas chromatography**.
6. Pharmaceutical analysis covers substances from various sources, including **all of the above**: animals, plants, and minerals.
7. To become a Pharmaceutical Analyst, knowledge in **all of the above** areas (Biology, Chemistry, and Physics) is essential.
8. The normality of lead (II) nitrate if the density of its 26% (w/w) aqueous solution is 3.105 g/mL and the molar mass of lead (II) nitrate is 331 g/mol is **4.878 N**.
9. The mole fraction of glycerin ( $\text{C}_3\text{H}_5(\text{OH})_3$ ) in a solution containing 33 g of glycerin, 60 g of isopropyl alcohol, and the rest water is **0.258**.
10. If a urea ( $\text{NH}_2\text{CONH}_2$ ) contains 45% (by mass)  $\text{N}_2$ , the actual urea content in the sample is **10.4 kg**.
11. The concentration of silica ( $\text{SiO}_2$ ) impurity in iron (III) oxide chunks, given it contains 80 ppm silica, is **0.008%**.
12. In a 0.3 molar solution formed by dissolving 3.33 g of  $\text{XCl}_2$  in 100 mL of water, the molar mass of element X is **40**.
13. The molality of a dilute aqueous 0.02 N  $\text{H}_3\text{PO}_4$  solution is **0.0067**.
14. The volume of concentrated acid required to prepare 500 mL of a 0.25 N HCl solution from concentrated stock HCl solution (specific gravity = 1.19) and 37.2% (by mass) is **10.307 mL**.
15. The primary purpose of standardizing a solution is **to accurately determine its concentration**.

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16. The substance commonly used as a primary standard for acid-base titrations is **Oxalic acid (C<sub>2</sub>H<sub>2</sub>O<sub>4</sub>)**.
17. The molarity of a 15 mL, 2 M aqueous solution when 285 mL of water is added to it is **0.100 M**.
18. The indicator commonly used in acid-base titrations is **Phenolphthalein**.
19. The molality of a dilute aqueous 0.02 N H<sub>3</sub>PO<sub>4</sub> solution is **0.0067**.
20. The normality of lead (II) nitrate if the density of its 26% (w/w) aqueous solution is 3.105 g/mL and the molar mass of lead (II) nitrate is 331 g/mol is **4.878 N**.
21. The type of chromatography that separates components based on size, charge, or hydrophobicity is **Size exclusion chromatography**.
22. The molar fraction of glycerin (C<sub>3</sub>H<sub>5</sub>(OH)<sub>3</sub>) in a solution containing 33 g of glycerin, 60 g of isopropyl alcohol, and the rest water is **0.258**.
23. The substance that is NOT a primary standard for standardizing sodium thiosulphate is **Mercuric oxide (HgO)**.
24. The purpose of using an indicator in a titration is **to detect the endpoint**.
25. The substance commonly used as a primary standard for acid-base titrations is **Oxalic acid (C<sub>2</sub>H<sub>2</sub>O<sub>4</sub>)**.
26. The purpose of standardizing a solution is **to accurately determine its concentration**.
27. The substance that is NOT a primary standard for standardizing sodium thiosulphate is **Mercuric oxide (HgO)**.
28. In the standardization of sodium thiosulphate, the role of the starch indicator is **to detect the endpoint**.
29. The reaction that represents the standardization of hydrochloric acid using sodium hydroxide is **HCl + NaOH → NaCl + H<sub>2</sub>O**.