Subject: **Chemistry**
Paper name: **Analytical Chemistry - I**
Paper No: **IV (T) (CHEM/4/CC/241)**
Semester: **IV**

A. Multiple Choice questions

1. An antidote that is referred to as a Universal Antidote is
   (a) milk
   (b) activated charcoal
   (c) egg albumin
   (d) water

2. Which one of the following will be the most suitable for heating the round-bottom flask?
   (a) Hot plate
   (b) Bunsen burner
   (c) Muffle flask
   (d) Heating mantle

3. The group reagent used in the analysis of Group III basic radicals/cations are
   (a) NH_4OH and NH_4Cl
   (b) H_2S
   (c) H_2S and HCl
   (d) $(NH_4)_2CO_3$

4. Which of the following ions are interfering ions?
   (a) $C_2O_4^{2-}$ and $C_4H_4O_6^{2-}$
   (b) BO^{3-}
   (c) PO_4^{3-} and F^-
   (d) All of the above

5. The ability of chemical compound to induce adverse health effect(s) due to a relatively short and single exposure is known as
   (a) Transient toxicity
   (b) acute toxicity
   (c) chronic toxicity
   (d) local toxicity

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6. The process of heating a liquid mixture to form vapours and then cooling the vapours to get pure compound is called
   (a) Distillation
   (b) Fractional Distillation
   (c) Chromatography
   (d) Sublimation

7. The organic liquid which is steam volatile and immiscible with water can be separated by
   (a) Distillation
   (b) Fractional distillation
   (c) Steam distillation
   (d) Evaporation

8. The process used to separate volatile substances from non-volatile substances is called
   (a) Sublimation
   (b) Solvent extraction
   (c) Liquid-liquid extraction
   (d) None of these

9. The number of oxygen atom in 18-Crown-6 is
   (a) 18
   (b) 9
   (c) 3
   (d) 6

10. The completely miscible solution can be separated by
   (a) A separating funnel
   (b) Evaporation
   (c) Fractional distillation
   (d) None of these

11. The number of significant figures in 0.00200 is
   (a) 5
   (b) 3
   (c) 2
   (d) 6

12. Confidence limit is given by the expression, $\bar{x} \pm \frac{ts}{\sqrt{N}}$. In this, 's' represents
   (a) Absolute error
   (b) Relative error

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(c) Standard deviation
(d) Relative standard deviation

13. The result of the arithmetical operation 21.1 x 0.023 x 83.2 expressed to the correct number of significant figure is
    (a) 50.91008
    (b) 50.91
    (c) 50.910
    (d) 51

14. The maximum uncertainty in the following expression (17.3±0.2) - (9.7±0.3) + (11.6±0.1) is
    (a) ± 1
    (b) ± 0.6
    (c) ± 0.3
    (d) ± 0.5

15. The absolute error in the expression (15.02 ± 0.02)(0.2000 ± 0.0001) is
    (a) ± 0.005
    (b) ± 0.05
    (c) ± 0.002
    (d) ± 0.02

16. Which of the following is the secondary standard
    (a) Na_2CO_3
    (b) $K_2Cr_2O_7$
    (c) $KMnO_4$
    (d) I_2

17. Which of the following is the primary standard
    (a) HCl
    (b) KOH
    (c) NaOH
    (d) $H_2C_2O_4.\ 2H_2O$

18. Equivalent weight of oxalic acid is
    (a) 60
    (b) 63
    (c) 120
    (d) 126

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19. For preparing 250 ml N/10 Na_2CO_3 solution, weight of Na_2CO_3 is
    (a) 53 g
    (b) 106 g
    (c) 5·3 g
    (d) 1·325 g

20. What is the normality (N) of 2M H_2SO_4?
    (a) 2N
    (b) 4N
    (c) 6N
    (d) 3N/2

21. Precipitation of salt take place if
    (a) its ionic product is equal to its solubility products
    (b) its ionic product is greater than its solubility products
    (c) its ionic product is less than its solubility products
    (d) none of the above

22. Which among the following forms a precipitate with oxine?
    (a) Molybdenum
    (b) Aluminium
    (c) calcium
    (d) Copper

23. An insoluble red -rose coloured complex is formed with Ni^{2+} ion using the reagent
    (a) Alizarin
    (b) Oxine
    (c) Cupferron
    (d) Dimethylglyoxime

24. Heating any precipitate to a certain temperature with a solvent is known as
    (a) distillation
    (b) Digestion
    (c) coprecipitation
    (d) post precipitation

25. The technique used to separate the ions from solution based on their solubilities is
    (a) homogeneous solubility
    (b) sublimation
    (c) fractional precipitation
    (d) fractional distillation

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B. Fill up the Blanks

1. Gasoline is more_____ than ethylene glycol as it has a flash point of approximately -40 degrees.
2. Flammable liquid should be heated on_____.
3. Substances that produce a very exothermic reaction when they come into contact with each other are known as_____.
4. The principle of solvent extraction is formed by _____ law.
5. The liquid boils at a temperature at which its vapour pressure becomes equal to the _____ pressure.
6. Germanium metal which is used in semiconductor device is purified by _____ method.
7. Accuracy is expressed in terms of _____ error.
8. The test which is used to decide whether to retain or reject a suspect result is called the _____ test.
9. When calculations involve operations of multiplication and division the _____ determinate errors are transmitted directly in to the final result.
10. In strong acid-strong base titration, the pH of the mixture in the initial stage is found out by the formulae_____.
11. If the molecular weight of $KMnO_4$ is 158, the equivalent weight of the same compound in the reaction $MnO_4^- \rightarrow Mn^{2+}$ is_____.
12. Indirect redox titration using sodium thiosulphate, $Na_2S_2O_3$ (usually) as a reducing agent is known as_____titration.
13. Postprecipitation occurs when the solution is_____.
14. The calcium is precipitated as_____and estimates as_____ gravimetrically.
15. The type of contamination of the precipitate occurred due to the incorporation of foreign ions within the crystal is termed_____.

Key Answer

A. Multiple Choice questions

1. (b)
2. (d)
3. (a)
4. (d)
5. (b)
6. (b)
7. (c)
8. (a)
9. (d)

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10. (c)
11. (b)
12. (c)
13. (d)
14. (b)
15. (a)
16. (c)
17. (d)
18. (b)
19. (d)
20. (b)
21. (b)
22. (b)
23. (d)
24. (b)
25. (c)

B. Fill up the Blanks

1. flammable
2. water bath
3. incompatible chemicals
4. Nernst distribution
5. Atmospheric
6. Zone refining
7. Absolute/relative
8. Quotient test
9. Relative
10. pH = - log $[H^{+}]$
11. 31·6
12. Iodometric.
13. Supersaturated
14. CaC_2O_4 and CaO
15. occlusion

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