JHARKHAND Rai University RANCHI

PRACTICE SET
End Semester Examination, December- 2025

Program: BMLT
Semester: I
Course: Chemistry for MLT
Course Code: 42ABMT 003

Course Outcomes	Description
CO1	The fundamental knowledge of measurement, chemical calculation & solutions
CO2	Learn about the properties of various elements and different types of bonding for understanding its application in paramedical domain.
CO3	Understand and apply the knowledge of chemical equilibrium as required in core area
CO4	Concept of Surface phenomena & Colloids and its application.
CO5	Understand basic ideas of organic compound and their reaction mechanism.

Section A: **(23 X 05= 115)**

1. Define atomic weight, molecular weight and equivalent weight. Give the relationship between them with suitable example.**[Unit-I, CO1] [Remembering] [LOT]**
2. Explain, How donormality, molality and molarity differ?Give one example of each.
[Unit-I, CO1] [Understanding][LOT]
3. State Avogadro's laws and explain its relationship with mole concept with example.
[Unit-I, CO1] [Remembering][LOT]
4. What do youunderstand by redox reactions?**[Unit-I, CO1] [Understanding][LOT]**
5. What is PPM? What is the no ofppm of NaCl in the solution with 117g of NaCl dissolved in 500ml of water? **[Unit-I, CO1] [Understanding][LOT]**
6. Explain how atomic size and ionization energy vary across a period and down a group.
[Unit-II, CO2] [Understanding][LOT]
7. Differentiate between, Electrovalent, Covalent and Coordinate bond?
[Unit-II, CO2] [Analyze][HOT]
8. Define valency.Explain how valency of elements changes across a period.
[Unit-II, CO2] [Remembering][LOT]
9. What is chemical bonding? What is a cause of chemical bonding?
[Unit-II, CO2] [Understanding][LOT]
10. State Valence bond theory. What areits merits and demerits?
[Unit-II, CO2] [Understanding][LOT]
11. Describe the Arrhenius concepts of acids and bases with suitable examples.
[Unit- III, CO3] [Remembering][LOT]
12. State the law of chemical equilibrium and derived the expression for equilibrium constant K_c.

[Unit- III, CO3] [Remembering][LOT]

13. What is Ostwald's dilution law? Explain its limitation.

[Unit- III, CO3] [Understanding] [LOT]

14. What is degree of dissociation?**[Unit- III, CO3] [Understanding] [LOT]**

15. Define buffer solution distinguish between acidic buffer and basic buffer.

[Unit- III, CO3] [Remembering] [LOT]

16. Distinguish between colloids, true solution, and suspension.

[Unit- IV, CO4] [Analyse] [HOT]

17. Define what Tyndall effect is? **[Unit- IV, CO4] [Remembering] [LOT]**

18. Explainwhat is Brownian movement?**[Unit- IV, CO4] [Understanding][LOT]**

19. In a colloidal system what isElectrophoresis? **[Unit- IV, CO4] [Understanding][LOT]**

20. Define Isomerism and its type with suitable example of organic compound.

[Unit- V, CO5] [Remembering][LOT]

21. Give the IUPAC names of following:

a) CH_3-CH(OH)-CH_2-CH_3 b)CH_3-CO-CH_2-CH_3 c) CH_3-C≡C-CH_3.

[Unit- V, CO5] [Remembering] [LOT]

22. Draw structure isomers possible for a compound having molecular formula $C_4H_{10}O$.

[Unit- V, CO5] [Remembering][LOT]

23. Define aromaticity and explain why benzene is aromatic.

[Unit- V, CO5] [Remembering] [LOT]

SectionB: **(13 X 10 = 130)**

24. a) How many moles and how many atoms are present in 18 g of H_2O?

b) A piece of Cu weights 0.635g. How many atoms of Cu does it contain?

[Unit- I, CO1][Apply][LOT]

25. Explain the oxidation state of oxygen in given molecules?

a) KO_2 b) H_2O_2 c) OF_2 d) CO_2 e) H_2O

[Unit- I, CO1][Apply][LOT]

26. Analyse the molarity and its SI unit? A solution prepared using 15 g of sodium sulphate. The solution is 125 ml find the molarity of the given solution of sodium sulphate.

[Unit- I, CO1][Analyse][HOT]

27. Simplify the concept of Hybridization.Predict the shape and Hybridization of molecules & ions given;

a)$BeCl_2$ b)BF_3. **[Unit- II, CO2][Analyse][HOT]**

28.Explain the variations of the following periodic properties with reason:

a) Ionisation energy b) Electron affinity c) Electron negativity.

[Unit- II, CO2] [Understand][LOT]

29. Debate about VSEPR theory. How it is used to predict shape and geometry of molecule.

A) Be_2F B) PF_5 C) NH_3 D)NH_4Cl. **[Unit- II, CO2] [Evaluate][HOT]**

30.Analyze the relationship between K_p & K_c for a gaseous equilibrium.

[Unit- III, CO3] [Analyse][HOT]

31. What is P^H. Calculate the P^H of 0.005 M H_2SO_4? **[Unit- III, CO3] [Understanding][LOT]**

32. K_{sp} of AgCl is $10^{-10,}$ Explain its solubility? **[Unit- III, CO3] [Understanding][LOT]**

33. What is adsorption? Gives its type. **[Unit-IV, CO4] [Understanding][LOT]**

34. Distinguish between adsorption & absorption. **[Unit-IV, CO4] [Analyse][HOT]**

35. A compound a has molecular formula C_8H_{16}. It shows structural isomerism.

a) Identify and draw isomers.

b) Simplify how their melting point might differ and why?

[Unit- V, CO5] [Analyse] [HOT]

36. Consider the aromatic electrophonic substitution of benzene ring to give nitrobenzene. Write step -by - step mechanism of nitration of benzene. **[Unit- V, CO5][Create] [HOT]**

Section- C: **(06 X 20 = 120)**

37. a) To 50 ml of 0.5M H_2SO_4,75ml of 0.25 M $H_2SO_4$is added. What is the concentration of the final solution if solution if its volume is 125 ml?**[Unit- I, CO1][Understanding][LOT]**

b)To what volume must 50 ml of 3.50 M H_2SO_4be diluted in order to make 2M H_2SO_4.

[Unit- I, CO1][Apply][LOT]

38. Balance this equation: MNO_4^-+ Fe^{+2}+H^+--→ Mn^{+2}+ Fe^{+3}. **[Unit- I, CO1][Analyse][HOT]**

39. Design the molecular orbital diagram of N_2 and O_2. **[Unit- II, CO2][Create][HOT]**

40. Analyze the molecular orbital theory with theory of chemical bonding.

[Unit- II, CO2] [Analyse][HOT]

41. Explain the concept of solubility and solubility product. Calculate the K_{sp} at 25^0C if solubility of CuBr = 2 x 10^{-4} mol/L. **[Unit- III, CO3] [Understand][LOT]**

42. Using buffer solution expression proved Henderson's equation.

[Unit- III, CO3] [Analyse] [HOT]

Summary Sheet

CO Wise

CO	Q. No.	Marks
CO1	1,2,3,4,5,24,25,26,37,38	95
CO2	6,7,8,9,10,27,28,29,39,40	95
CO3	11,12,13,14,15,30,31,32,41,42	95
CO4	16,17,18,19,33,34	40
CO5	20,21,22,23,35,36	40
Total		**365**

Unit Wise

Unit	Q. No.	Marks
Unit 1	1,2,3,4,5,24,25,26,37,38	95
Unit 2	6,7,8,9,10,27,28,29,39,40	95
Unit 3	11,12,13,14,15,30,31,32,41,42	95
Unit 4	16,17,18,19,33,34	40
Unit 5	20,21,22,23,35,36	40
Total		**365**

Blooms Taxonomy Level (BTL) Wise

BTL	Q. No.	Marks
LOT	1,2,3,4,5,6,8,9,10,11,12,13,14,15,17,18,19,20,21,22,23, 24,25,28,31,32,33,37,41	205
HOT	7, 16,26,27,29,30,34, 35,36,38,39,40,42	160
Total		**365**

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Disclaimer: - This is a Practice Set. The Question in End term examination will differ from the Practice set. This Practice set is meant for practice only.