Chemistry

DPS-1

Class XI

DAILY PRACTICE SHEET

Some Basic Concepts of Chemistry

Instructions

- DPS-1 contains 50 topicwise questions including 5 exam section questions.
- Each question has four options out of which only one option is correct.
- Each question carries 4 marks.
- Mark the correct answer in the OMR Sheet given at the end of the DPS.

Max. Marks : 200 **Time :** 50 minutes

General Introduction

1. Two students *X* and *Y* report the weight of the same substance as 4.0 g and 4.00 g respectively. Which of the following statement is correct?
(a) Both are equally accurate.
(b) *X* is more accurate than *Y*.
(c) *Y* is more accurate than *X*.
(d) Both are inaccurate scientifically.

2. **Assertion :** The greater the number of significant figures in a reported result, smaller is the uncertainty and greater is the precision.

Reason : A significant figure includes all the digits that are known with certainty plus one more digit which is estimated or is uncertain.
(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

3. Match the following.

	List I		List II
A.	1 Faraday	(i)	10^{-5} N
B.	1 Dyne	(ii)	0.2390 cal
C.	1 Joule	(iii)	2.389×10^{-8} cal
D.	1 Litre	(iv)	9.6487×10^{4} coulomb
E.	1 Erg	(v)	10^{-3} m^3

(a) A-(iv), B-(i), (C)-(ii), (D)-(v), (E)-(iii)
(b) A-(ii), B-(i), (C)-(iv), (D)-(iii), (E)-(v)
(c) A-(i), B-(ii), (C)-(iii), (D)-(iv), (E)-(v)
(d) A-(v), B-(iii), (C)-(iv), (D)-(ii), (E)-(i)

4. Mark the rule which is not correctly stated about the determination of significant figures.

(a) Zeros preceding to first non-zero digit are not significant.
(b) Zeros between two non-zero digits are not significant.
(c) Zeros at the end or right of the number are significant if they are on the right side of decimal point.
(d) All non-zero digits are significant.

Laws of Chemical Combinations

5. **Assertion :** 12 parts by mass of carbon in CO and CO_2 molecules combine with 16 and 32 parts by mass of oxygen.
Reason : A given compound always contains exactly the same proportion of elements by weight.
(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

6. Which of the following statement is correct about the reaction given below?

$$4Fe_{(s)} + 3O_{2(g)} \longrightarrow 2Fe_2O_{3(g)}$$

(a) Total mass of iron and oxygen in reactants = total mass of iron and oxygen in product therefore it follows law of conservation of mass.
(b) Total mass of reactants = total mass of product; therefore, law of multiple proportions is followed.
(c) Amount of Fe_2O_3 can be increased by taking any one of the reactants (iron or oxygen) in excess.
(d) Amount of Fe_2O_3 produced will decrease, if the amount of any one of the reactants (iron or oxygen) is taken in excess.

7. When burnt in air, 14.0 g mixture of carbon and sulphur gives a mixture of CO_2 and SO_2 in the volume ratio of 2 : 1, volume being measured at the same conditions of temperature and pressure. Number of moles of carbon in the mixture is
(a) 0.75 (b) 0.5 (c) 0.40 (d) 0.25

8. **Assertion :** In a gaseous reaction, the ratio by volumes of reactants and gaseous products is in agreement with their molar ratio.
Reason : Volume of gas is inversely proportional to its number of moles at particular temperature and pressure.
(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

9. Which of the following statements indicates that law of multiple proportion is being followed?
(a) Sample of carbon dioxide taken from any source will always have carbon and oxygen in the ratio 1:2.
(b) Carbon forms two oxides namely CO_2 and CO, where masses of oxygen which combine with fixed mass of carbon are in the simple ratio 2:1.
(c) When magnesium burns in oxygen, the amount of magnesium taken for the reaction is equal to the amount of magnesium in magnesium oxide formed.
(d) At constant temperature and pressure, 200 mL of hydrogen will combine with 100 mL of oxygen to produce 200 mL of water vapour.

Dalton's Atomic Theory

10. Which law directly explains the law of conservation of mass?
(a) Dalton's law (b) Avogadro's law
(c) Berzillius law (d) Hund's rule

11. Which of the following postulates of Dalton's atomic theory explains the law of constant proportion?
(a) Atoms of given element are identical in mass and chemical properties.
(b) Atoms combine in the ratio of small whole numbers to form compounds.
(c) The relative number and kind of atoms are constant in a given compound.
(d) All of these.

Atomic and Molecular Masses

12. If one gram of a metal carbonate gave 0.56 g of its oxide on heating, then equivalent weight of the metal will be
(a) 30 (b) 40 (c) 25 (d) 20

13. **Assertion :** Mass numbers of most of the elements are fractional.
Reason : Mass numbers are obtained by comparing with mass number of carbon taken as 12.
(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

Mole Concept and Molecular Masses

14. The largest number of atoms are present in
(a) 5 g of NH_3 (b) 11 g of CO_2
(c) 8 g of SO_2 (d) 4 g of H_2

15. Match the List I with List II and select the correct answer using the code given below the lists.

	List I	List II
P.	Mass of H_2 produced when 0.5 mole of zinc reacts with excess of HCl	1. 3.01×10^{23} molecules
Q.	Mass of a molecule of a compound with formula $C_{70}H_{22}$	2. 6.023×10^{23} molecules
R.	Number of molecules in 35.5 g of Cl_2	3. 1.43×10^{-21} g
S.	Number of molecules in 64 g of SO_2	4. 1 g

	P	Q	R	S
(a)	2	1	4	3
(b)	1	2	3	4
(c)	4	3	1	2
(d)	4	3	2	1

16. The density of a liquid is 1.2 g/mL. There are 35 drops in 2 mL. The number of molecules in 1 drop is (molecular weight of liquid = 70)
(a) $\frac{1.2}{35}N_A$ (b) $\left(\frac{1}{35}\right)^2 N_A$
(c) $\frac{1.2}{(35)^2}N_A$ (d) $1.2N_A$

17. If 3.01×10^{20} molecules are removed from 98 mg of H_2SO_4, then the number of moles of H_2SO_4 left is
(a) 0.1×10^{-3} (b) 0.5×10^{-3}
(c) 1.66×10^{-3} (d) 9.95×10^{-2}

18. How many valence electrons are present in 0.53 g of Na_2CO_3?
(a) $40 \times 6.023 \times 10^{23}$ (b) $0.2 \times 6.023 \times 10^{23}$
(c) $0.4 \times 6.023 \times 10^{23}$ (d) $2 \times 6.023 \times 10^{23}$

19. The total number of electrons present in 18 mL of water (density of water is 1 g mL^{-1}) is
(a) 6.02×10^{23} (b) 6.02×10^{22}
(c) 6.02×10^{24} (d) 6.02×10^{25}

20. A 5 L vessel contains 2.8 g of N_2. When heated to 1800 K, 30% molecules are dissociated into atoms. Identify the correct statement.
(a) Total number of moles in the container will be 0.13.
(b) Total number of molecules in the container will be 0.78×10^{23}.
(c) Total number of atoms in the container will be 0.06.
(d) All of the above.

21. The total number of protons in 10 g of calcium carbonate is ($N_0 = 6.023 \times 10^{23}$)
(a) 1.5057×10^{24} (b) 2.0478×10^{24}
(c) 3.0115×10^{24} (d) 14.0956×10^{24}

Percentage Composition

22. Two oxides of a metal contain 27.6% and 30.0% of oxygen respectively. If the formula of the first oxide is M_3O_4, then second one is
(a) MO_2 (b) M_2O (c) M_2O_3 (d) M_3O_2

23. 0.30 g of an organic compound containing C, H and O on combustion yielded 0.44 g CO_2 and 0.18 g H_2O. If 1 mole of compound weighs 60 g, then molecular formula of the compound is
(a) $C_2H_4O_2$ (b) CH_2O
(c) C_3H_8O (d) C_4H_{12}

24. The oxygen-carrying protein known as haemoglobin is 0.335% Fe by mass and contains four Fe atoms per haemoglobin molecule. Calculate the molecular weight of this protein.
(a) 66 g mol^{-1} (b) 66.6 g mol^{-1}
(c) 6.6683×10^4 g mol^{-1} (d) 666 g mol^{-1}

25. The empirical formula of an organic compound containing carbon and hydrogen is CH_2. The mass of one litre of this organic gas is exactly equal to that of one litre of N_2. Therefore, the molecular formula of the organic gas is
(a) C_2H_4 (b) C_3H_6 (c) C_6H_{12} (d) C_4H_8

26. A 400 mg iron capsule contains 100 mg of ferrous fumarate, $(CHCOO)_2Fe$. The percentage of iron present in it, is approximately
(a) 33% (b) 25% (c) 14% (d) 8%

Stoichiometry and Stoichiometric Calculations

27. In a reaction container, 100 g of hydrogen and 100 g of Cl_2 are mixed for the formation of HCl gas. What is the limiting reagent and how much HCl is formed in the reaction?
(a) H_2 is limiting reagent and 36.5 g of HCl is formed.
(b) Cl_2 is limiting reagent and 102.8 g of HCl is formed.
(c) H_2 is limiting reagent and 142 g of HCl is formed.
(d) Cl_2 is limiting reagent and 73 g of HCl is formed.

28. **Assertion :** The molality of a solution does not change with change in temperature.

Reason : The molality is expressed in units of moles per 1000 g of solvent.

(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

29. A compound of iron and chlorine is soluble in water. An excess of silver nitrate was added to precipitate the chloride ion as silver chloride. If a 134.8 mg of the compound gave 304.8 mg of AgCl, what is the formula of the compound?

(a) $FeCl_6$ (b) $FeCl_3$
(c) $FeCl_2$ (d) $FeCl_4$

30. When 22.4 litres of $H_{2(g)}$ is mixed with 11.2 litres of $Cl_{2(g)}$, each at S.T.P, the moles of $HCl_{(g)}$ formed is equal to

(a) 1 mol of $HCl_{(g)}$ (b) 2 mol of $HCl_{(g)}$
(c) 0.5 mol of $HCl_{(g)}$ (d) 1.5 mol of $HCl_{(g)}$

31. Match the Column I with Column II.

Column I		Column II	
A.	6.3 g oxalic acid in 100 mL solution	p.	1 N
B.	9.8 g H_2SO_4 in 209.8 g solution [density 1.049 g/mL]	q.	3 N
C.	A solution containing 46% ethanol (*w*/*w*)	r.	18.5 M
D.	98 g phosphoric acid per litre	s.	Semi-molar

	A	B	C	D
(a)	s	p	r	q
(b)	s	p	q	r
(c)	q	s	r	p
(d)	r	q	p	s

32. One litre of oxygen at STP is made to react with three litres of carbon monoxide at STP. Which one is the limiting reactant?

(a) CO (b) O_2
(c) CO_2 (d) None of these.

33. How much water is needed to dilute 10 mL of 10 N hydrochloric acid to make it exactly decinormal (0.1 N)?

(a) 990 mL (b) 1000 mL
(c) 1010 mL (d) 100 mL

34. 2 g of a mixture of CO and CO_2 on reaction with excess I_2O_5 produced 2.54 g of I_2. What would be the mass % of CO_2 in the original mixture?

(a) 60 (b) 30 (c) 70 (d) 35

35. **Assertion :** The normality of 0.3 M aqueous solution of H_3PO_3 is equal to 0.6 N.

Reason : Equivalent weight of H_3PO_3

$$= \frac{\text{Molecular weight of } H_3PO_3}{3}$$

(a) If both assertion and reason are true and reason is the correct explanation of assertion.
(b) If both assertion and reason are true but reason is not the correct explanation of assertion.
(c) If assertion is true but reason is false.
(d) If both assertion and reason are false.

36. In the reaction,

$$2Al_{(s)} + 6HCl_{(aq)} \longrightarrow 2Al^{3+}_{(aq)} + 6Cl^-_{(aq)} + 3H_{2(g)}$$

(a) 112 L $H_{2(g)}$ at STP is produced for every mole $HCl_{(aq)}$ consumed
(b) 6 L $HCl_{(aq)}$ is consumed for every 3 L $H_{2(g)}$ produced
(c) 33.6 L $H_{2(g)}$ is produced regardless of temperature and pressure for every mole Al that reacts
(d) 67.2 L $H_{2(g)}$ at STP is produced for every mole Al that reacts.

37. The ratio of amounts of H_2S needed to precipitate all the metal ions from 100 mL of 1 M $AgNO_3$ and 100 mL of 1 M $CuSO_4$ will be

(a) 1 : 1 (b) 1 : 2
(c) 2 : 1 (d) None of these.

38. Match the List I showing products of reactions to the List II showing amount of the product formed and select the correct answer using the code given below the lists :

List I		List II
P.	$\underset{1\text{ g}}{2H_2} + \underset{1\text{ g}}{O_2} \longrightarrow 2H_2O$	1. 0.56 g
Q.	$\underset{1\text{ g}}{N_2} + \underset{1\text{ g}}{3H_2} \longrightarrow 2NH_3$	2. 1.333 g
R.	$CaCO_3 \xrightarrow{\Delta} \underset{1\text{ g}}{CaO}$	3. 1.125 g
S.	$\underset{1\text{ g}}{2H_2} + \underset{1\text{ g}}{C} \longrightarrow CH_4$	4. 1.214 g

	P	Q	R	S
(a)	3	4	1	2
(b)	3	2	4	1
(c)	1	4	3	2
(d)	3	4	2	1

39. Bromine is prepared commercially by the reaction: $2Br^-_{(aq)} + Cl_{2(aq)} \rightarrow 2Cl^-_{(aq)} + Br_{2(aq)}$
Suppose we have 50.0 mL of 0.060 M solution of NaBr. What volume of 0.05 M solution of Cl_2 is needed to react completely with the Br^- ?
(a) 30 mL (b) 40 mL (c) 20 mL (d) 60 mL

40. What will be the molarity (in mol L^{-1}) of a solution, which contains 5.85 g of $NaCl_{(s)}$ per 500 mL?
(a) 4 (b) 20
(c) 0.2 (d) 2

41. A sample of $NaNO_3$ weighing 0.38 g is placed in a 50.0 mL measuring flask. The flask is then filled with water upto the mark on the neck. What is the molarity of the solution?
(a) 0.85 M
(b) 0.090 M
(c) 0.0045 M
(d) 0.075 M

42. A metal oxide has the formula Z_2O_3. It can be reduced by hydrogen to give free metal and water. 0.1596 g of the metal oxide requires 6 mg of hydrogen for complete reduction. The atomic weight of the metal is
(a) 27.9 (b) 159.6
(c) 79.8 (d) 55.8

43. Match the List I with List II and select the correct answer using the code given below the lists :

	List I		List II
P.	4.5 m solution of $CaCO_3$ (density 1.45 g/mL)	1.	Mole fraction of solute = 0.2
Q.	100 mL of 3 M H_2SO_4 mixed with 300 mL of 1 M H_2SO_4 solution	2.	Mass of the solute is 360 g
R.	14.5 m solution of Ca	3.	Molarity = 4.5 M
S.	40 g of NaOH is added to 2 L of 4 M NaOH solution	4.	Molarity 1.5 M

	P	Q	R	S
(a)	4	3	2	1
(b)	2	3	4	1
(c)	3	4	1	2
(d)	3	2	1	4

44. The density of 3 M sodium thiosulphate is 1.25 g mL^{-1}. Identify the correct statement(s) among the following.
(a) % by weight of sodium thiosulphate is 37.92.
(b) The mole fraction of sodium thiosulphate is 0.065.
(c) The molality of Na^+ is 7.74 and $S_2O_3^{2-}$ is 3.87.
(d) All of the above.

45. An experiment requires 100 cm^3 of 20.0% H_2SO_4, density 1.14 g/cm^3. How much concentrated acid of density 1.80 g/cm^3 and containing 98% H_2SO_4 by weight, must be diluted with water to prepare 100 cm^3 acid of the required solution?
(a) 8.1 cm^3 (b) 12.7 cm^3
(c) 18.1 cm^3 (d) 21.3 cm^3

EXAM SECTION

46. A mixture of gases contains H_2 and O_2 gases in the ratio of 1 : 4 (*w/w*). What is the molar ratio of the two gases in the mixture?
(a) 16 : 1 (b) 2 : 1
(c) 1 : 4 (d) 4 : 1 *(AIPMT 2015)*

47. What is the mass of the precipitate formed when 50 mL of 16.9% solution of $AgNO_3$ is mixed with 50 mL of 5.8% NaCl solution?
(Ag = 107.8, N = 14, O = 16, Na = 23, Cl = 35.5)
(a) 3.5 g (b) 7 g
(c) 14 g (d) 28 g *(AIPMT 2015)*

48. If Avogadro number N_A, is changed from 6.022×10^{23} mol^{-1} to 6.022×10^{20} mol^{-1}, this would change
(a) the mass of one mole of carbon
(b) the ratio of chemical species to each other in a balanced equation
(c) the ratio of elements to each other in a compound
(d) the definition of mass in units of grams.
(AIPMT 2015)

49. The number of water molecules is maximum in
(a) 1.8 gram of water
(b) 18 gram of water
(c) 18 moles of water
(d) 18 molecules of water. *(AIPMT 2015)*

50. Suppose the elements *X* and *Y* combine to form two compounds XY_2 and X_3Y_2. When 0.1 mole of XY_2 weighs 10 g and 0.05 mole X_3Y_2 weighs 9 g, the atomic weights of *X* and *Y* are
(a) 40, 30 (b) 60, 40
(c) 20, 30 (d) 30, 20
(NEET Phase-II 2016)

OMR SHEET

INSTRUCTIONS

- Use HB pencil only and darken each circle completely.
- If you wish to change your answer, erase the already darkened circle completely and then darken the appropriate circle.
- Mark only one choice for each question as indicated.

Correct marking ● ⓑ ⓒ ⓓ

Wrong marking ⊗ ✓ ◑ ◉

1. ⓐ ⓑ ⓒ ⓓ	11. ⓐ ⓑ ⓒ ⓓ	21. ⓐ ⓑ ⓒ ⓓ	31. ⓐ ⓑ ⓒ ⓓ	41. ⓐ ⓑ ⓒ ⓓ
2. ⓐ ⓑ ⓒ ⓓ	12. ⓐ ⓑ ⓒ ⓓ	22. ⓐ ⓑ ⓒ ⓓ	32. ⓐ ⓑ ⓒ ⓓ	42. ⓐ ⓑ ⓒ ⓓ
3. ⓐ ⓑ ⓒ ⓓ	13. ⓐ ⓑ ⓒ ⓓ	23. ⓐ ⓑ ⓒ ⓓ	33. ⓐ ⓑ ⓒ ⓓ	43. ⓐ ⓑ ⓒ ⓓ
4. ⓐ ⓑ ⓒ ⓓ	14. ⓐ ⓑ ⓒ ⓓ	24. ⓐ ⓑ ⓒ ⓓ	34. ⓐ ⓑ ⓒ ⓓ	44. ⓐ ⓑ ⓒ ⓓ
5. ⓐ ⓑ ⓒ ⓓ	15. ⓐ ⓑ ⓒ ⓓ	25. ⓐ ⓑ ⓒ ⓓ	35. ⓐ ⓑ ⓒ ⓓ	45. ⓐ ⓑ ⓒ ⓓ
6. ⓐ ⓑ ⓒ ⓓ	16. ⓐ ⓑ ⓒ ⓓ	26. ⓐ ⓑ ⓒ ⓓ	36. ⓐ ⓑ ⓒ ⓓ	46. ⓐ ⓑ ⓒ ⓓ
7. ⓐ ⓑ ⓒ ⓓ	17. ⓐ ⓑ ⓒ ⓓ	27. ⓐ ⓑ ⓒ ⓓ	37. ⓐ ⓑ ⓒ ⓓ	47. ⓐ ⓑ ⓒ ⓓ
8. ⓐ ⓑ ⓒ ⓓ	18. ⓐ ⓑ ⓒ ⓓ	28. ⓐ ⓑ ⓒ ⓓ	38. ⓐ ⓑ ⓒ ⓓ	48. ⓐ ⓑ ⓒ ⓓ
9. ⓐ ⓑ ⓒ ⓓ	19. ⓐ ⓑ ⓒ ⓓ	29. ⓐ ⓑ ⓒ ⓓ	39. ⓐ ⓑ ⓒ ⓓ	49. ⓐ ⓑ ⓒ ⓓ
10. ⓐ ⓑ ⓒ ⓓ	20. ⓐ ⓑ ⓒ ⓓ	30. ⓐ ⓑ ⓒ ⓓ	40. ⓐ ⓑ ⓒ ⓓ	50. ⓐ ⓑ ⓒ ⓓ

For every correct answer award yourself 4 marks. For every incorrect answer deduct 1 mark.

SELF CHECK

No. of questions attempted .....

No. of questions correct .....

Marks scored in percentage .....

Check your score! If your score is

> 90%	EXCELLENT WORK !	You are well prepared to take the challenge of final exam.
90-75%	GOOD WORK !	You can score good in the final exam.
74-60%	SATISFACTORY !	You need to score more next time
< 60%	NOT SATISFACTORY!	Revise thoroughly and strengthen your concepts.