

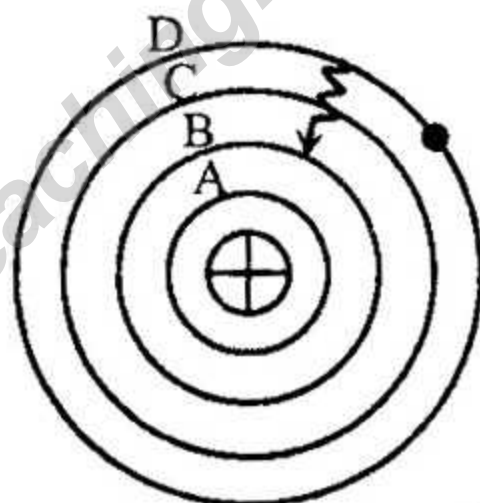
[N.B. -The figures in the right margin indicate full marks. Read the stems carefully and answer the associated questions. Answer any five questions.]

Na

H₂SO₄

1. ►
- | Chemical substance-A | Chemical substance-B |
|--|----------------------|
| a. What is suspension? | 1 |
| b. Why the 19th electron of potassium goes to 4s orbital instead of 3d orbital? | 2 |
| c. Explain safe preservation of chemical substance-A in laboratory. | 3 |
| d. What is the importance of limit use of chemical substance-B in laboratory for the preservation of environment? Analyse. | 4 |

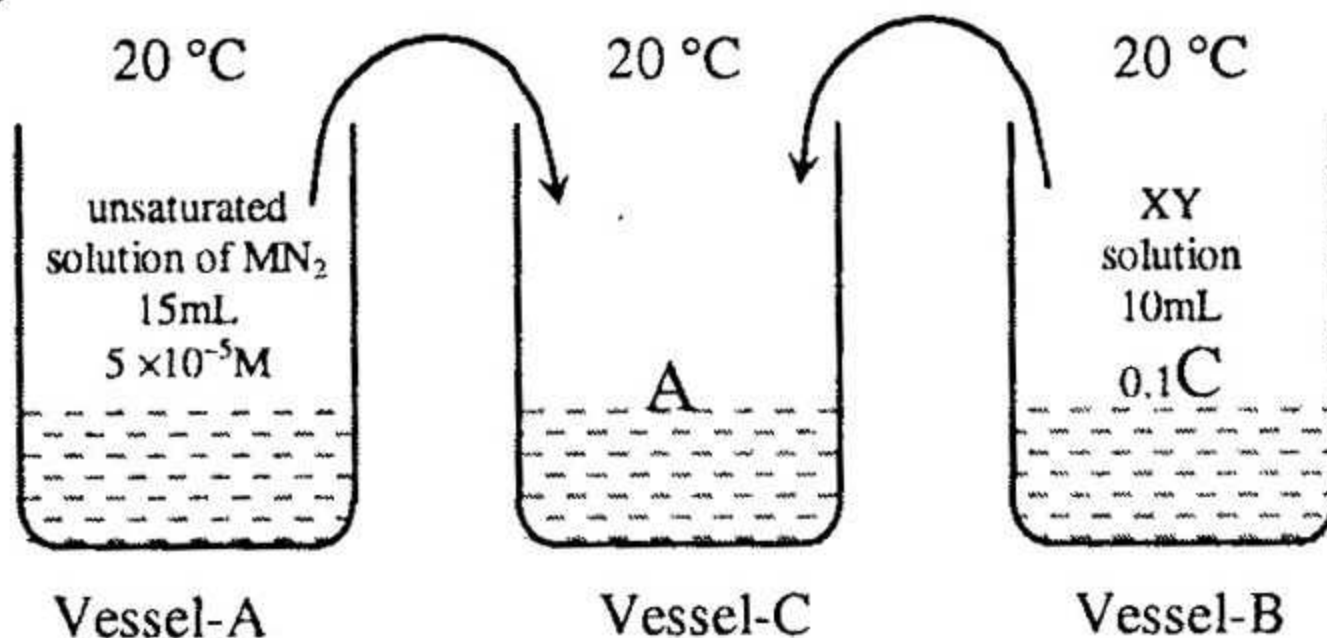
2. ★



$$R_H = 109678\text{cm}^{-1}$$

- | | |
|--|---|
| a. State the law of mass action. | 1 |
| b. The P ^H of pure water is 7—Explain. | 2 |
| c. Calculate the number of orbital's in the outermost shell of the stem. | 3 |
| d. What will be the colour of the emitted rays if the electron of the stem transmitted to B-shell? Analyse mathematically. | 4 |

3. ▶



(i) Solubility of $MN_2 = 0.0002 \text{ mol L}^{-1}$

(ii) K_{sp} of $MY_2 = 1.85 \times 10^{-8}$

- What is sigma bond? 1
- Al_2O_3 is an amphoteric oxide— Explain. 2
- Calculate the solubility product of the salt of vessel- 'A'. 3
- Is the precipitate of MY_2 formed in vessel- 'C'? Analyse mathematically. 4

4. ▶

Element	Electronic configuration of outermost shell
A	$(n-2)S^1$
B	$(n-1)S^2(n-1)P^3$
C	$(n-1)S^2(n-1)P^4$
D	nS^2np^4

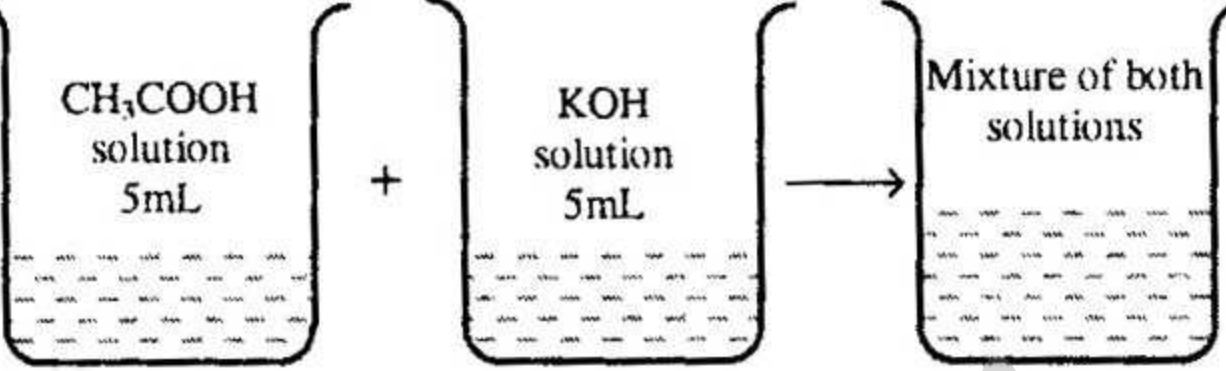
Here, $N = 3$.

- What is polarity? 1
- Why is Fe called transition metal? 2
- A_2D is a gaseous substance—Explain. 3
- Which bond angle is higher between the hydrides of B and C? Analyse. 4

5. ★

Period	Group	
	1	17
2	—	X
3	P	Y
4	—	Z

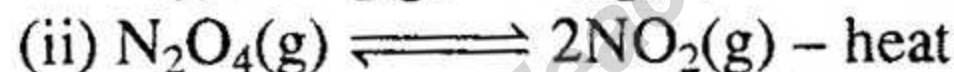
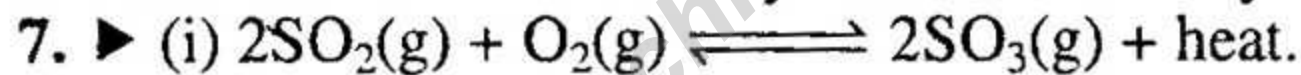
- a. What is Buffer solution? 1
- b. Heat of neutralization of NaOH and HCl is constant— Explain. 2
- c. Electron affinity of Y is greater than X—Explain. 3
- d. Which compound is more ionic between PY and PZ? Analyse. 4

6. 

Vessel-A Vessel-B Vessel-C

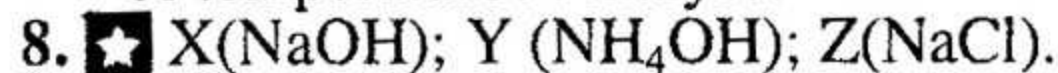
$K_a = 1.8 \times 10^{-5}$

- a. What is ionisation potential? 1
- b. F is the most electronegative element — Explain. 2
- c. Calculate the pH of the solution of vessel-A. 3
- d. Will the value of pH change of small amount of HCl is added to vessel-C? Analyse mathematically. 4



25% N_2O_4 is dissociated at 27°C temperature and 1 atm pressure.

- a. What is vinegar? 1
- b. Why dewatering of butter is necessary? 2
- c. Calculate the value of K_p of reaction no. (ii). 3
- d. Which reaction yield maximum product with the increase of temperature? Analyse. 4



- a. What is 4-digit balance? 1
- b. Explain Pauli exclusion principle. 2
- c. Explain the role of 'Z' for food examining. 3
- d. Which compound of the stem is suitable to prepare glass cleaner? Analyse. 4

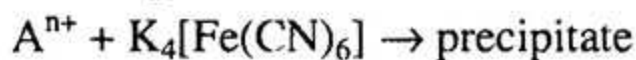
[N.B. Choose the best answer among the options. Fill the circle in the answer sheet with ball point pen. Each question has value 1.]

- Which compound is used in canning of mangoes?
 (a) Ascorbic acid (b) Citric acid
 (c) Vinegar (d) Formalin
- Which of the following is used to measure the volume of solution accurately?
 (a) Pipette and measuring cylinder
 (b) Burette and pipette
 (c) Burette and graduated beaker
 (d) Graduated beaker and measuring cylinder
- ★ Which one of the following is preservatives?
 (a) Na_2SO_4 (b) NaNO_3
 (c) CH_3COONa (d) $\text{C}_6\text{H}_5\text{COONa}$
- Which of the following acid has more strength?
 (a) H_2SO_4 (b) HClO_4
 (c) H_3PO_4 (d) HNO_3
- Which one of the following is used as dehydrating agent?
 (a) N_2O_5 (b) P_2O_5
 (c) Cl_2O_5 (d) V_2O_5
- Which one of the following has common ion effect?
 (a) H_2S , HCl
 (b) NaCl , CH_3Cl
 (c) CH_4 , HCl
 (d) CaCl_2 , $\text{C}_6\text{H}_5\text{Cl}$
- For P sub shell—
 i. $l = 1$
 ii. $m = -1, 0, +1$
 iii. number of orbital is 2
 Which one is correct?
 (a) i and ii (b) ii and iii
- (c) i and iii (d) i, ii and iii
- ★ Which ion of the following forms coloured compound?
 (a) Cu^+ (b) Sc^{3+}
 (c) Ni^{2+} (d) Zn^{2+}
- Which one of the following shows linear geometrical shape?
 (a) BCl_3 (b) H_2O
 (c) $\text{CH}_3\text{—CH}_3$ (d) CO_2
- What is the solubility product of CaF_2 when its solubility is 0.0002 mol/L?
 (a) 2.3×10^{-11} (b) 3.2×10^{-11}
 (c) 2.3×10^{-10} (d) 3.2×10^{-10}
- What type of hybridization is present in PCl_5 ?
 (a) sp (b) sp^2
 (c) sp^3 (d) sp^3d
- How many bonds are present in the compound $[\text{Cu}(\text{NH}_3)_4]\text{Cl}_2$?
 (a) 6 (b) 8
 (c) 14 (d) 18
- Octet incomplete compounds are—
 i. NH_3
 ii. BF_3 iii. AlCl_3
 Which one is correct?
 (a) i and ii (b) ii and iii
 (c) i and iii (d) i, ii and iii
- ★ The causes of food getting rotten are—
 i. presence of lipid
 ii. oxidation of food
 iii. deficiency of antioxidant
 Which one is correct?
 (a) i and ii (b) ii and iii
 (c) i and iii (d) i, ii and iii

15. What is the ionic product of pure water at room temperature?

- (a) 1×10^{-14} (b) 1×10^{14}
 (c) 1×10^{-7} (d) 1×10^7

Look at the following stem and answer to the questions No. 16 and 17 : —



16. If the precipitate is red —

- the element of A^{n+} ion is transition element
- it forms complex compound having four co-ordination number
- it shows diamagnetic properties

Which one is correct?

- (a) i and ii (b) ii and iii
 (c) i and iii (d) i, ii and iii

17. If the precipitate is white, A^{n+} ion will be—

- (a) Ca^{2+} (b) Zn^{2+}
 (c) Cu^{2+} (d) Fe^{2+}

18. ★ Active mass is meant by—

- molar concentration
- partial pressure
- molecular mass

Which one is correct?

- (a) i and ii (b) ii and iii
 (c) i and iii (d) i, ii and iii

19. What is the pH of 1% HCl solution?

- (a) 0.56 (b) 1.0
 (c) 2.6 (d) 5.6

20. Which one of the following produces highest heat of neutralization by the reaction with sodium hydroxide?

- (a) HNO_3 (b) HF

- (c) HCl (d) H_2SO_4

21. Which one is used as a lubricating agent in cold cream?

- (a) Liquid paraffin
 (b) Propyle paraben
 (c) Glycerin
 (d) Wax

22. The chemicals used for cleaning of glassware's in laboratory are—

- H_2SO_4
- $K_2Cr_2O_7$
- $CHCl_3$

Which one is correct?

- (a) i and ii (b) ii and iii
 (c) i and iii (d) i, ii and iii

23. ★ 

What does it mean by this sign of the stem?

- (a) Irritant (b) Corrosive
 (c) Harmful
 (d) Electrical hazard

Look at the stem and answer to the questions No. 24 and 25 : —

A metal 'X' shows golden-yellow colour in flame test.

24. What is the nature of the metal?

- (a) Metalloid
 (b) Coinage metal
 (c) Alkaline earth metal
 (d) Alkaline metal

25. Which one is the identification reactant of 'X' metal ion?

- (a) $K_2H_2Sb_2O_7$
 (b) $(NH_4)_2C_2O_4$
 (c) $K_4[Fe(CN)_6]$
 (d) NH_4CNS

Ans.	1	(b)	2	(b)	3	(d)	4	(b)	5	(b)	6	(b)	7	(a)	8	(c)	9	(d)	10	(b)	11	(d)	12	(d)	13	(b)
	14	(d)	15	(a)	16	(a)	17	(b)	18	(a)	19	(a)	20	(b)	21	(a)	22	(a)	23	(a)	24	(d)	25	(a)		