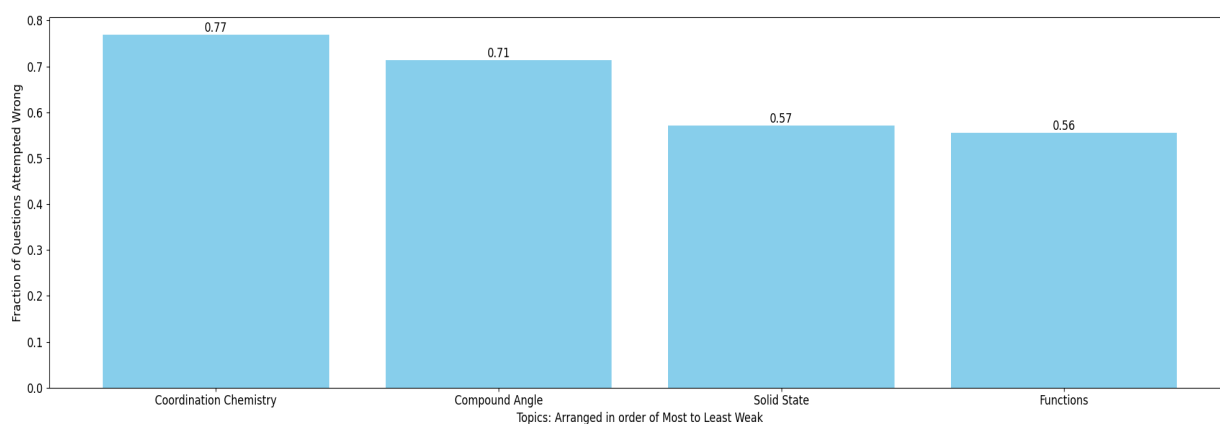


# Aakash sharma Total MLAssist - Personalised DPP

## Question Paper Analysis:



## Weak Topic Analysis:



## Practice Questions:

### Coordination Chemistry:

6. Ammonia forms the complex ion  $[\text{Cu}(\text{NH}_3)_4]^{2+}$  with copper ions in alkaline solutions but not in acidic solution. What is the reason for it :- [AIEEE-2003]
- (1) In acidic solutions hydration protects copper ions  
(2) In acidic solutions protons coordinate with ammonia molecules forming  $\text{NH}_4^+$  ions and  $\text{NH}_3$  molecules are not available  
(3) In alkaline solutions insoluble  $\text{Cu}(\text{OH})_2$  is precipitated which is soluble in excess of any alkali  
(4) Copper hydroxide is an amphoteric substance
- 
43. Among  $[\text{Ni}(\text{CO})_4]$ ,  $[\text{NiCl}_4]^{2-}$ ,  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$ ,  $\text{Na}_3[\text{CoF}_6]$ ,  $\text{Na}_2\text{O}_2$  and  $\text{CsO}_2$ , the total number of paramagnetic compounds is - [JEE Ad. 2016]
- (A) 2                      (B) 3                      (C) 4                      (D) 5
3. Which of the following compound(s) show(s) optical isomerism.  
(A)  $[\text{Pt}(\text{bn})_2]^{2+}$               (B)  $[\text{CrCl}_2(\text{en})_2]^+$               (C)  $[\text{Co}(\text{en})_3][\text{CoF}_6]$               (D)  $[\text{Zn}(\text{gly})_2]$
12. The number of donor sites in dimethyl glyoxime, glycinate, diethylene triamine and EDTA are respectively:  
(A) 2, 2, 3 and 4              (B) 2, 2, 3 and 6              (C) 2, 2, 2 and 6              (D) 2, 3, 3 and 6
65.  $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$  (atomic number of Cr = 24) has a magnetic moment of 3.83 B.M. The correct distribution of 3d electrons in the chromium present in the complex is:  
(A)  $3d_{xy}^1, 3d_{yz}^1, 3d_{zx}^1$                                       (B)  $3d_{xy}^1, 3d_{yz}^1, 3d_{x^2}^1$   
(C)  $3d_{(x^2-y^2)}^1, 3d_{z^2}^1, 3d_{xz}^1$                                       (D)  $3d_{xy}^1, 3d_{(x^2-y^2)}^1, 3d_{yz}^1$

### Compound Angle:

3. The sum of all possible values of  $\cot x$  for which  $9\sin x + 2\cos x = 6$ , is
- (A)  $\frac{-5}{4}$                       (B)  $\frac{-9}{8}$                       (C)  $\frac{4}{5}$                       (D)  $\frac{9}{8}$
18. If A, B, C denote the angles of a triangle ABC then prove that the triangle is right angled if and only if  $\sin 4A + \sin 4B + \sin 4C = 0$
5.  $\tan \alpha = p/q$  where  $\alpha = 6\beta$ ,  $\alpha$  being an acute angle,  
 prove that:  $\frac{1}{2}(p \operatorname{cosec} 2\beta - q \sec 2\beta) = \sqrt{p^2 + q^2}$ .
13. Find the exact value of  $\tan^2 \frac{\pi}{16} + \tan^2 \frac{3\pi}{16} + \tan^2 \frac{5\pi}{16} + \tan^2 \frac{7\pi}{16}$
- (A) 21                      (B) 24                      (C) 28                      (D) 36
13. If  $\frac{\cos^2 x}{\cos^2 y} + \frac{\sin^2 x}{\sin^2 y} = 1$ , then prove that  $\frac{\cos^2 y}{\cos^2 x} + \frac{\sin^2 y}{\sin^2 x} = 1$ .

### Solid State:

23. Match the column

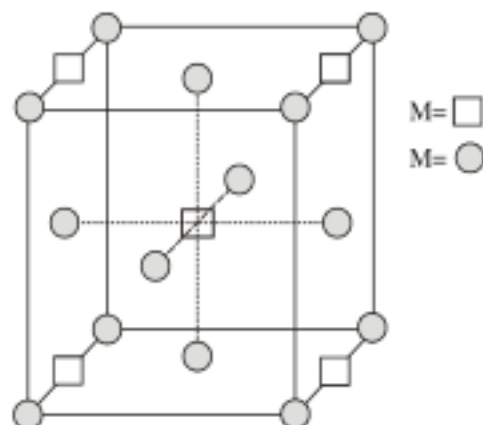
#### Column I

- (A) Tetragonal and Hexagonal  
 (B) Cubic and Rhombohedral  
 (C) Monoclinic and Triclinic  
 (D) Cubic and Hexagonal

#### Column II

- (P) are two crystal systems  
 (Q)  $a = b \neq c$   
 (R)  $a \neq b \neq c$   
 (S)  $a = b = c$

10. A compound  $M_pX_q$  has cubic close packing (ccp) arrangement of X. Its unit cell structure is shown below. The empirical formula of the compound is: [JEE-2012]



- (A)  $MX$                       (B)  $MX_2$                       (C)  $M_2X$                       (D)  $M_5X_{14}$

1.73 Å, the edge length of the cell is:

[Jee-Main (online)-12]

- (A) 314.20 pm                      (B) 216 pm                      (C) 200 pm                      (D) 1.41 pm

11. The number of hexagonal faces that present in a truncated octahedron is. [JEE-2011]

4. The parameters of the unit cell of a substance are  
 $a = 2.5$ ,  $b = 3.0$ ,  $c = 4.0$ ,  $\alpha = 90^\circ$ ,  $\beta = 120^\circ$ ,  $\gamma = 90^\circ$ .

[JEE Main, July 2021]

The crystal system of the substance is :

- (A) Hexagonal                      (B) Orthorhombic  
 (C) Monoclinic                      (D) Triclinic

### Functions:

4. The value of  $f(-89) - f(-67) + f(46)$  is equal to

- (A) 4                      (B) 5                      (C) 6                      (D) 7

### MULTIPLE CORRECT TYPE

42. Let  $A = \{1, 2, 3, 4, \dots, 10\}$  and  $B = \{0, 1, 2, 3, 4\}$ . The number of elements in the relation  $R = \{(a, b) \in A \times A : 2(a-b)^2 + 3(a-b)^2 + 3(a-b) \in B\}$  is \_\_\_\_\_. [JEE - Main 2023]

4. If  $f(x) = -1 + |x - 2|, 0 \leq x \leq 4$   $g(x) = 2 - |x|, -1 \leq x \leq 3$   
Then find  $f \circ g(x)$  &  $g \circ f(x)$ . Draw rough sketch of the graphs of  $f \circ g(x)$  &  $g \circ f(x)$ .

1. Find the number of integer in the range of the function,

$$f(x) = \sqrt{\sin \frac{\pi x}{2}} + \sqrt{16 - x^2} + \sqrt{x} + \log_2 (x(x - 2))$$

### Daily Work Sheet-2

#### SINGLE CORRECT TYPE

5. Which of the following statements are incorrect? I. If  $f(x)$  and  $g(x)$  are one to one then  $f(x) + g(x)$  is also one to one.  
II. If  $f(x)$  and  $g(x)$  are one-one then  $f(x) \cdot g(x)$  is also one-one.  
III. If  $f(x)$  is odd then it is necessarily one to one.  
(A) I and II only (B) II and III only  
(C) III and I only (D) I, II and III
6. Let  $A = \{1, 2, 3, 4\}$  and  $B = \{1, 2, 3, 4\}$ . If  $f: A \rightarrow B$  is an one-one function and  $f(x) \neq x$  for all  $x \in A$ , then the number of such possible functions, is  
(A) 6 (B) 9 (C) 24 (D) 44