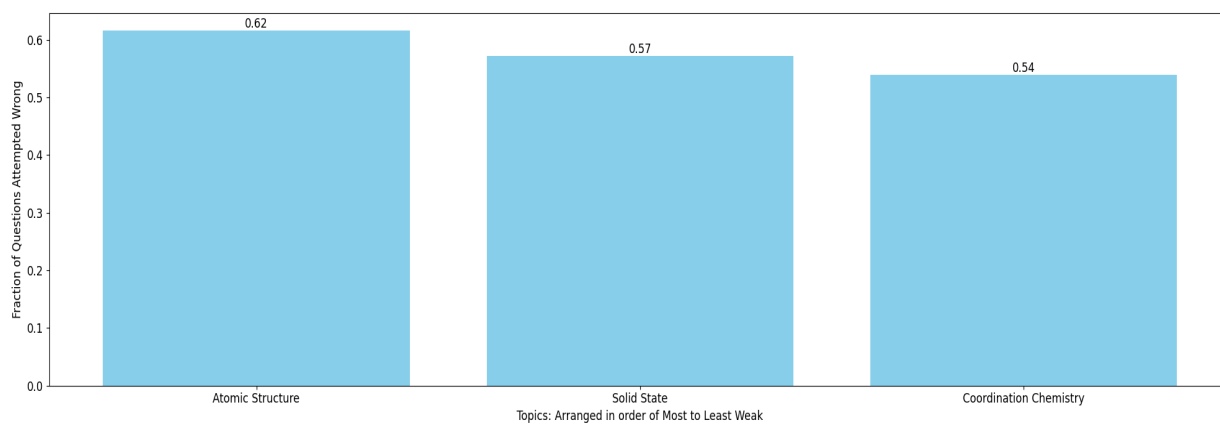


# Ayush dhar dubey Total MLAssist - Personalised DPP

## Question Paper Analysis:



## Weak Topic Analysis:



## Practice Questions:

### Atomic Structure:

27. Based on the equation [JEE-Main(online) 2014]

$$\Delta E = -2.0 \times 10^{-18} \text{ J} \left( \frac{1}{n_2^2} - \frac{1}{n_1^2} \right)$$

the wavelength of the light that must be absorbed to excite hydrogen electron from level  $n = 1$  to level  $n = 2$  will be ( $h = 6.625 \times 10^{-34} \text{ Js}$ ,  $C = 3 \times 10^8 \text{ ms}^{-1}$ )

- (1)  $2.650 \times 10^{-7} \text{ m}$     (2)  $1.325 \times 10^{-7} \text{ m}$     (3)  $1.325 \times 10^{-10} \text{ m}$     (4)  $5.300 \times 10^{-10} \text{ m}$

6. (a) Calculate velocity of electron in first Bohr orbit of hydrogen atom (Given  $r = a_0$ )  
(b) Find de-Broglie wavelength of the electron in first Bohr orbit. [IIT-2005]

(c) Find the orbital angular momentum of 2p-orbital in terms of  $h/2\pi$  units.

1. Which of the following could be derived from Rutherford's  $\alpha$ -particle scattering experiment-

- (A) Most of the space in the atom is empty  
(B) The radius of the atom is about  $10^{-10} \text{ m}$  while that of nucleus is  $10^{-15} \text{ m}$   
(C) Electrons move in a circular path of fixed energy called orbits  
(D) Radius of nucleus is directly proportional to cubic root of mass number.

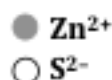
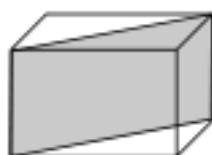
42. If  $p$  is the momentum of the fastest electron ejected from a metal surface after the irradiation of light having wavelength  $\lambda$ , then for  $1.5 p$  momentum of the photoelectron, the wavelength of the light should be : (Assume kinetic energy of ejected photoelectron to be very high in comparison to work function) : [JEE Main (April) 2019]

- (1)  $\frac{3}{4}\lambda$                       (2)  $\frac{4}{9}\lambda$                       (3)  $\frac{1}{2}\lambda$                       (4)  $\frac{2}{3}\lambda$

54. If the work function of a metal is  $6.63 \times 10^{-19} \text{ J}$ , the maximum wavelength of the photon required to remove a photoelectron from the metal is \_\_\_\_\_ nm. (Nearest integer) [Given:  $h =$

### Solid State:

14. Element 'B' forms ccp structure and 'A' occupies half of the octahedral voids, while oxygen atoms occupy all the tetrahedral voids. The structure of bimetallic oxide is : **[Jee Main, April 2019]**  
(A)  $AB_2O_4$                       (B)  $A_4B_2O$                       (C)  $A_4BO_4$                       (D)  $A_2B_2O$
6. A metal crystallises in bcc. Find the % fraction of edge length not covered and also % fraction of edge length covered by atom is:
3. In a solid,  $S^{2-}$  ions are packed in fcc lattice.  $Zn^{2+}$  occupies half of the tetrahedral voids in an alternating arrangement. Now if a plane is cut (as shown) then the cross-section would be:



11. A match box exhibit -  
(A) Cubic geometry                      (B) Monoclinic geometry  
(C) Tetragonal geometry                      (D) Orthorhombic geometry
13. Consider the bcc unit cells of the solids 1 and 2 with the position of atoms as shown below. The radius of atom B is twice that of atom A. The unit cell edge length is 50% more in solid 2 than in

### Coordination Chemistry:

67. Which one of the following complexes is an outer orbital complex?  
(A)  $[Fe(CN)_6]^{4-}$                       (B)  $[Mn(CN)_6]^{4-}$   
(C)  $[Co(NH_3)_6]^{3+}$                       (D)  $[Ni(NH_3)_6]^{2+}$

2. Which of the following statement(s) is (are) correct ?  
 (A) The oxidation state of iron in sodium nitroprusside  $\text{Na}_2[\text{Fe}(\text{CN})_5(\text{NO})]$  is +2.  
 (B)  $[\text{Ag}(\text{NH}_3)_2]^+$  is linear in shape.  
 (C) In  $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$ , Fe is  $d^2sp^3$  hybridized.  
 (D) In  $\text{Ni}(\text{CO})_4$ , the oxidation state of Ni is zero.
37. The formula of the complex hydridotrimethoxidoborate(III) ion is:  
 (A)  $[\text{BH}(\text{OCH}_3)_3]^{2-}$  (B)  $[\text{BH}_2(\text{OCH}_3)_3]^{2-}$  (C)  $[\text{BH}(\text{OCH}_3)_3]^-$  (D)  $[\text{BH}(\text{OCH}_3)_3]^+$
50. The pair having the same magnetic moment is:- [J-MAIN-2016]  
 [At. No.: Cr = 24, Mn = 25, Fe = 26, Co = 27]  
 (1)  $[\text{CoCl}_4]^{2-}$  and  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$  (2)  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{CoCl}_4]^{2-}$   
 (3)  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$  (4)  $[\text{Mn}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{Cr}(\text{H}_2\text{O})_6]^{2+}$
30. Which of the following complex ions will exhibit optical isomerism? [J-MAIN-2012, Online]  
 (en = 1, 2-diamine ethane)  
 (1)  $[\text{Co}(\text{en})_2\text{Cl}_2]^+$  (2)  $[\text{Zn}(\text{en})_2]^{2+}$   
 (3)  $[\text{Co}(\text{NH}_3)_4\text{Cl}_2]^+$  (4)  $[\text{Cr}(\text{NH}_3)_2\text{Cl}_2]^+$
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