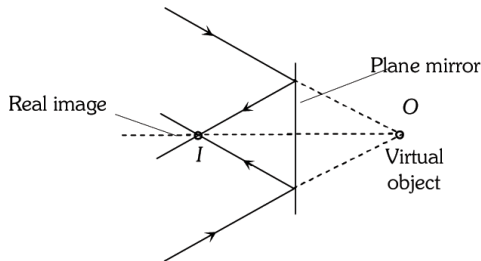


WEEKLY TEST OYM TEST - 22 Balliwala
SOLUTION Date 15-09-2019

[PHYSICS]

1. (d) $\delta = (360 - 2\theta) = (360 - 2 \times 60) = 240^\circ$

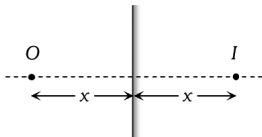
2. (b) When converging beam incident on plane mirror, real image is formed as shown



3. (c, d) By keeping the incident ray is fixed, if plane mirror rotates through an angle θ reflected ray rotates through an angle 2θ .

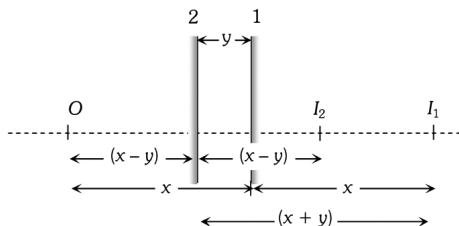


4. (c) Suppose at any instant, plane mirror lies at a distance x from object. Image will be formed behind the mirror at the same distance x .

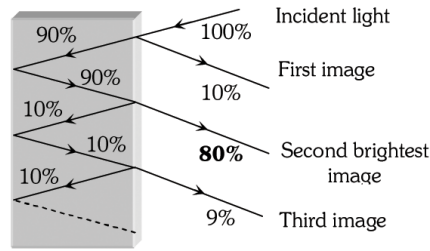


When the mirror shifts towards the object by distance 'y' the image shifts $= x + y - (x - y) = 2y$

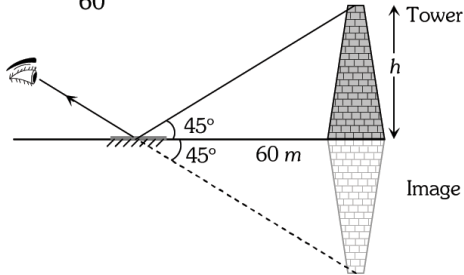
So speed of image $= 2 \times$ speed of mirror



5. (b) Several images will be formed but second image will be brightest

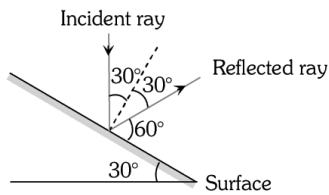


6. (b) $\tan 45^\circ = \frac{h}{60} \Rightarrow h = 60 \text{ m}$



7. (b) In two images man will see himself using left hand.
 8. (b) Size of image formed by a plane mirror is same as that of the object. Hence its magnification will be 1.

9. (c)



10. b

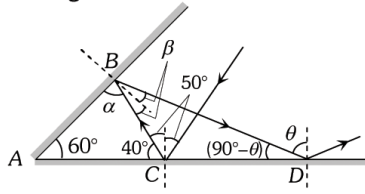
11. (c) $n = \left(\frac{360}{\theta} - 1\right) \Rightarrow n = \left(\frac{360}{72} - 1\right) = 4$

12. (c) $n = \left(\frac{360}{\theta} - 1\right) \Rightarrow 3 = \left(\frac{360}{\theta} - 1\right) \Rightarrow \theta = 90^\circ$

13. (c) $n = \frac{360}{45} - 1 = 7$

14. (b) Diminished, erect image is formed by convex mirror.

15. (c) Let required angle be θ



From geometry of figure

$$\text{In } \triangle ABC; \alpha = 180^\circ - (60^\circ + 40^\circ) = 80^\circ$$

$$\Rightarrow \beta = 90^\circ - 80^\circ = 10^\circ$$

$$\text{In } \triangle ABD; \angle A = 60^\circ, \angle B = (\alpha + 2\beta)$$

$$= (80 + 2 \times 10) = 100^\circ \text{ and } \angle D = (90^\circ - \theta)$$

$$\therefore \angle A + \angle B + \angle D = 180^\circ \Rightarrow 60^\circ + 100^\circ + (90^\circ - \theta)$$

$$= 180^\circ \Rightarrow \theta = 70^\circ$$

CHEMISTRY

- 16.
17. Octahedral complex has 6 centres for coordination to the central metal ion. EDTA has 6 centres for coordination. Hence, only **one** molecule is required.
- 18.
- 19.
- 20.
- 21.
22. CO is a strong ligand. 6 electrons of $3d^5 4s^1$ form pairs and no unpaired electron is left.
23. Though NH_3 and CN^- both are strong ligands yet NH_3 cannot vacate two d -orbitals from Ni^{2+} : $[\text{Ar}]3d^8$

$\uparrow\downarrow$	$\uparrow\downarrow$	$\uparrow\downarrow$	\uparrow	\uparrow
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. Here hybridisation is sp^3d^2 .
24. $[\text{Ni}(\text{CN})_4]^{4-}$: $x - 4 = -4 \Rightarrow x = 0$
25. In $[\text{MnCl}_4]^{2-}$, Mn^{2+} : $[\text{Ar}]3d^5$ has 5 unpaired electrons.
In $[\text{CoCl}_4]^{2-}$, Co^{2+} : $[\text{Ar}]3d^7$ has 3 unpaired electrons.
In both Cl^- is a weak ligand.
In $[\text{Fe}(\text{CN})_6]^{4-}$, CN^- is a strong ligand. Fe^{2+} : $[\text{Ar}]3d^6$ will have no unpaired electron.
26. Mn^{2+} , $3d^5$ will have **five** unpaired electrons because H_2O is a weak ligand.
27. $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$ gives four ions in water.
- 28.
29. 2Cl^- of ionic sphere out of total 3Cl^- i.e., **2/3rd** will be precipitated as AgCl .
30. (i) $[\text{Cu}^{\text{II}}(\text{NH}_3)_4]^{2+}[\text{Pt}^{\text{II}}\text{Cl}_4]^{2-}$
(ii) $[\text{Cu}^{\text{II}}\text{Cl}(\text{NH}_3)_3]^{1+}[\text{Pt}^{\text{II}}\text{Cl}_3(\text{NH}_3)]^{1-}$
(iii) $[\text{Cu}^{\text{II}}\text{Cl}_2(\text{NH}_3)_2]^0[\text{Pt}^{\text{II}}\text{Cl}_2(\text{NH}_3)_2]^0$ not possible
(iv) $[\text{Pt}^{\text{II}}\text{Cl}(\text{NH}_3)_3]^{1+}[\text{Cu}^{\text{II}}\text{Cl}_3(\text{NH}_3)]^{1-}$
(v) $[\text{Pt}^{\text{II}}(\text{NH}_3)_4]^{2+}[\text{Cu}^{\text{II}}\text{Cl}_4]^{2-}$