

Category - A

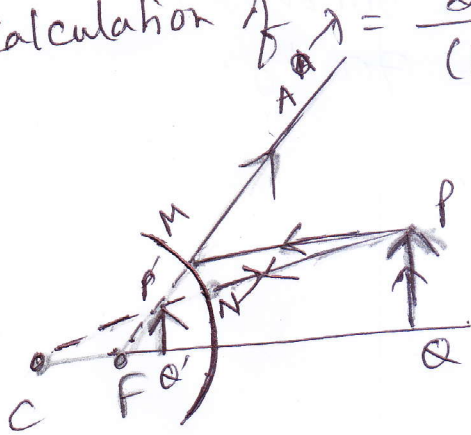
1. $X=Y$ in magnitude but opposite in direction (0.5+0.2)
 or, $X=-Y$ (0.7)
 No acceleration (0.3)

2. $\lambda = \frac{c}{f}$ (0.4 marks)

Identification of $c = 3 \times 10^8 \text{ m}$ (0.4 marks)

Calculation of $\lambda = \frac{3 \times 10^8}{(10^3)10^3} = \frac{3 \times 10^5}{10} \text{ m} = 300 \text{ m}$ (0.2 mark)

③



Concave (उत्तम दर्प) (0.7 mark)

उत्तम → 0.8 mark
 (diverging rays)

PN ray same direction
 PM reflected ray at
 intersection point P
 MA direction

④ a) 4, b) 1, c) 2, d) 3, (0.5 for each correct answer)

⑤ विद्युत्चुम्बकीय विद्युत्चुम्बकीय (No partial mark)

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⑦ Heat content $\Rightarrow 37(10+x) = (15 \times 10) + 50x$ (1 mark)

$\Rightarrow 13x = 220 \Rightarrow x = \frac{220}{13} \approx 17 \text{ Kg}$ (0.5 mark)

8. sides of original cube = $\sqrt[3]{125} = 5$ units (0.5 mark)
Edge that has no black = $(5-2) = 3$ units (1 mark)
so non-black cube = $(3)^3 = 27$ (Answer) (0.5 marks)

9. $F = ma = mg = m$ cancels (1 mark)

10. Total weight of lift = $g(700 + 600) = 1300 \text{ kg} \times g$
 $= 13000 \text{ N}$ (1 mark)

The weight of the support

$$= 2000 \times 10 = 20,000 \text{ N},$$

The remaining force = $20,000 - 13,000 = 7000 \text{ N}$

The extra mass = 700 kg .