SCHOLASTIC APTITUDE TEST (SAT)_PAPER

1. **(4)**

Sol. Time of Flight = 8 sec

Time of Ascent = Time of Descent - $\frac{8}{1}$ = 4 sec

Height, H = $\frac{1}{2}gt^2$

$\frac{1}{2}\times 10\times 4^2 = 80\text{m}$

Velocity with which strike ground,
V = gt
= 10 x 4 = 40 m/s

2. **Bonus**

Sol. Let, Final temperature of mixture = θ^oC
Heat loss by steam = Heat gain by ice

$(200\times 540)+(200\times 1\times(100-\theta)) = (800\times 80)+(800\times 1\times\theta)$

$1000\ \theta = 108000+20000-64000$

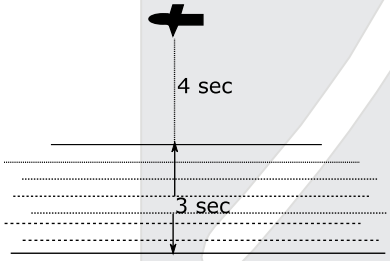
$\therefore\ \theta = \frac{64000}{1000} = 64^oC$

All options are incorrect

3. **(2)**

4. **(1)**

Sol.



Distance $= (4\times 350)+(2\times 1500)$
= 1400 + 3000
= 4400m
= 4.4 km

6. **(2)**

Sol. $\frac{\text{Sin}i}{\text{Sin}r} = \frac{\mu_2}{\mu_1} = \frac{v_1}{v_2}$

$\frac{\text{Sin}45^o}{\text{Sin}30^o} = \frac{3\times 10^8}{1/2}$

$$\frac{1/\sqrt{2}}{1/2} = \frac{3\times10^8}{v_2}$$

$$\sqrt{2} = \frac{3\times10^8}{v_2}$$

$$\therefore\ v_2 = \frac{3\times10^8}{\sqrt{2}} = 2.12\times10^8\ m/s$$

8. **(2)**

Sol. Given $I_2 = \frac{I_1}{3}$

V = 220 V

P_1 = 1320 W

P_2 = ?

$$\frac{P_1}{P_2} = \frac{VI_1}{VI_2} = 3$$

$$\therefore\ P_2 = \frac{P_1}{3} = 440W$$

9. **(3)**

Sol. $$\text{Power} = \frac{\text{Work}}{\text{Time}} = \frac{250\times10\times150}{60} = \frac{37500}{6}\ W$$

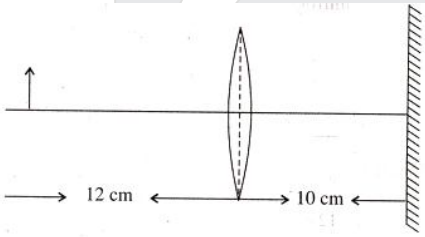
$$= \frac{37500}{6\times746}\ \text{(horse power)}$$

= 8.36 (horse power)

= 8 (horse power)

11. **(1)**

Sol.



For Lens,

u = –12cm

F = + 20 cm

$$\frac{1}{V} = \frac{1}{f} + \frac{1}{u}$$

$$= \frac{1}{20} + \frac{1}{-12}$$

$$= \frac{3-5}{60}$$

$= \frac{1}{-30}$

V = - 30 cm

For Mirror,
U = - (10 + 30) cm
= - 40 cm

V = - u
= + 40 cm
∴ Final image is 40cm behind mirror.

13. **(1)**

Sol. $P = P_1 + P_2 + P_3$
$2.7 = 2.5 + 1.7 + P_3$
∴ P_3 = - 1.5 D

81. **(3)**

Sol. 7, 14, 21, ……994
A = 7 d = 7 a_n = 994
$a_n = a + (n-1)\,d$
$\Rightarrow 994 = 7 + (n-1)7$
$\Rightarrow 994 = 7n - 7 + 7 \Rightarrow n = 142$
$S_{m3} = S_{m3} = \frac{142}{2}[7 + 994] = 71071$

82. **(1)**

Sol. FV = 100
MV = 120
D = 20%
Let ror be 'x'
$\frac{20}{120} = \frac{x}{100}$
Ans: 16.67%

83. **(4)**

Sol. $\frac{(x-1)(x+1)(x+7)}{(x+7)(x-7)} = x+1$

84. **(2)**

Speed of boat x kmph
Speed of stream y kmph
$\frac{30}{x+y} = 3 \qquad \frac{30}{x-y} = 5$
x + y = 10 ……..(1)
x – y = 6 ……(2) x = 8 kmph

85. **(3)**

Sol. (2 + 4 + 6 + 8 + …….1000) – (1 + 3 + 5 + …….999)
$500 \times 501 - 500^2 = 500(501 - 500) =$ **500 Ans**

86. **(1)**

Sol. $\text{Median} = L + \left(\frac{n/2 - CF}{f}\right)H$

$= 50 + \left(\frac{50-38}{18}\right)10 = 56.66$

87. **(4)**

Sol. a, b, c ax in G.P

$b = \sqrt{ac}$

$\Rightarrow 27 - x = \sqrt{(21-x)(35-x)}$

$\Rightarrow 729 + x^2 - 54x = 735 - 56x + x^2$

$\Rightarrow 2x = 6 \rightarrow x = 3 \rightarrow x^2 = 9$

88. **(1)**

Sol. $\frac{1}{2} \times D_1D_2 = 96$

$\Rightarrow D_1D_2 = 192 \quad \Rightarrow D_1 - D_2 = 4$

$\Rightarrow (D_1 + D_2)^2 - 4D_1D_2 = 16$

$(D_1 + D_2)^2 = 784 \quad \Rightarrow D_1 + D_2 = 28$

$\Rightarrow D_1 - D_2 = 4 \rightarrow (1)$

$D_1 + D_2 = 28 \rightarrow (2)$

By solving (1) and (2)

$D_1 = 16 \qquad D_2 = 12.$

Side of Rhombus 10cm

So Ans = 2cm

89. **(2)**

Sol. Let C.P. = x

x + 12% of x = 10304

$\Rightarrow \frac{112x}{100} = 10304$

$\Rightarrow x = 9200$ Rs.

GST Amount $= 1104$

SGST $= 552$ Rs.

90. **(4)**

Sol. $3\sqrt{5}\,m - 30 = 0$

$m = \frac{30}{3\sqrt{5}} = \frac{10 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = 2\sqrt{5}$

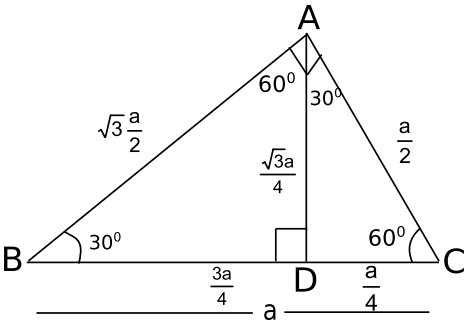
91. **(1 and 4)**

Sol. $\frac{Ar(\Delta APQ)}{Ar(\Delta ABC)} = \frac{1}{2} \quad \Rightarrow \frac{AP}{AB} = \frac{1}{\sqrt{2}}$

$\frac{BP}{AB} = \frac{\sqrt{2}-1}{\sqrt{2}} = \frac{2-\sqrt{2}}{2}$

92. **(2)**

Sol.



$$\frac{\text{perimeter of ABD}}{\text{Perimeter of ACD}} = \frac{\left(\sqrt{3}+1\right)}{\left(3+\sqrt{3}\right)}$$

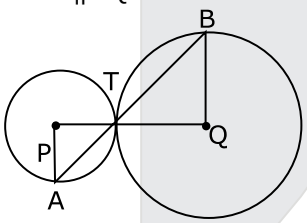
Rationalize $\frac{\left(\sqrt{3}+1\right)\left(3-\sqrt{3}\right)}{2}$

$$= \frac{3\sqrt{3}+3-\sqrt{3}-3}{2} = \frac{2\sqrt{3}}{2} = \frac{\sqrt{3}}{1}$$

93. **(2)**

Sol. Use similarity and angles are in alttemate seg.

Si PA || BQ



94. **(3)**

Sol. By observation

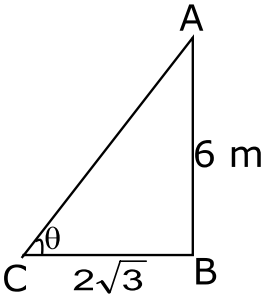
95. **(4)**

Sol. $\tan\theta = \frac{3}{\sqrt{3}}$

= $\tan\theta = \sqrt{3}$

= $\tan\theta = \tan 60°$

= $\theta = 60°$



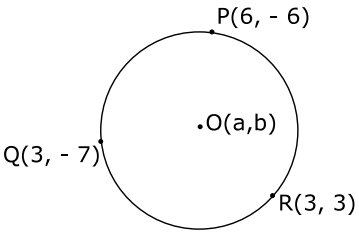
96. **(1)**

Sol. $OP^2 = OQ^2$

$(a - 6)^2 + (b + 6)^2 = (a - 3)^2 + (b + 7)^2$

$6a + 2b = 14$

$3a + b = 7$



$OQ^2 = OR2$

$(a - 3)^2 + (b + 7)^2 = (a - 3)^2 + (b - 3)^2$

$(b + 7)^2 = (b - 3)^2$

$b^2 + 14b + 49 = b^2 - 6b + 9$

$20b = -40$

$b = -2$

$a = 3$

97. **(3)**

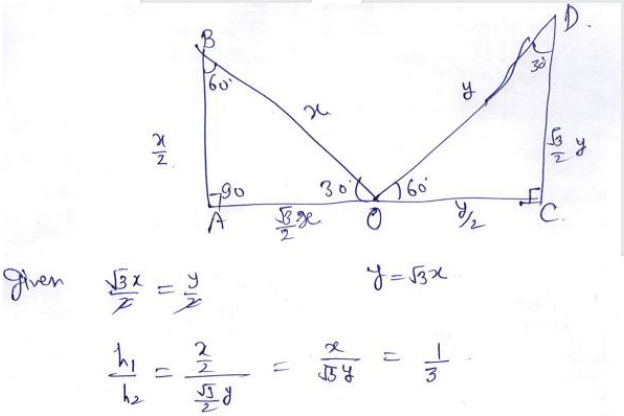
Sol. let Height of Cuboid = H

$$\frac{1}{3}\times\pi\times7^2\times9 = 6\times11\times H$$

By solving H = 7 cm

98. **(4)**

Sol.



Given $\frac{\sqrt{3}x}{2} = \frac{y}{2}$ $\quad y = \sqrt{3}x$

$$\frac{h_1}{h_2} = \frac{\frac{x}{2}}{\frac{\sqrt{3}}{2}y} = \frac{x}{\sqrt{3}y} = \frac{1}{3}$$

99. **(4)**

Sol. Length of wire = ℓ radius of wire = $\frac{1}{5}$cm

$$\frac{4}{3}\times\pi\times3^3 = \pi\times\left(\frac{1}{5}\right)^2\times\ell$$

$$\ell = 36\times25$$

$$\ell = 900\,\text{cm} = 9\text{m}$$

100. (2)

Sol.

$\Delta ADB \sim \Delta ABC$

$\Rightarrow \frac{AD}{AB} = \frac{AB}{AC}$

$\Rightarrow \frac{8}{b} = \frac{b}{18} \Rightarrow b^2 = 144$

$b = 12cm$