

SECTION A : SOLUTION

1. (A)

$$\frac{x_1}{x_2} = \frac{6}{5} \Rightarrow x_1 = 6k \text{ and } x_2 = 5k$$

$$\text{Also, } x_1 + x_2 = 66$$

$$k = 6$$

$$\Rightarrow \text{Current age} = 36 \text{ \& } 30$$

$$\Rightarrow \frac{36+x}{30+x} = \frac{8}{7} \Rightarrow x = 12 \text{ years}$$

2. (D)

$$(1 - \tan A + \sec A)(1 - \cot A + \operatorname{cosec} A)$$

$$= \left(\frac{\cos A - \sin A + 1}{\cos A} \right) \left(\frac{\sin A - \cos A + 1}{\sin A} \right) = \frac{1 - (\cos A - \sin A)^2}{\cos A \cdot \sin A} = 2$$

3. (C)

$$\text{Numbers are } 2x, 3x, 4x \Rightarrow \text{Lcm} = 12x = 240$$

$$x = 20$$

$$\Rightarrow 40, 60, 80, \text{HCF} = 20$$

4. (C)

$$\text{Required No.} = \frac{99}{3} - 3 = 30$$

5. (A)

$$\tan \theta = a/b \Rightarrow \frac{\cos \theta + \sin \theta}{\cos \theta - \sin \theta} = \frac{1 + \tan \theta}{1 - \tan \theta} = \frac{b+a}{b-a}$$

6. (B)

$$\frac{\cos^2 25^\circ + \cos^2 65^\circ}{\sin^2 59^\circ + \sin^2 31^\circ} = \frac{\cos^2 65^\circ + \sin^2 65^\circ}{\sin^2 59^\circ + \sin^2 59^\circ} = 1$$

7. (B)

$$\frac{a}{b+c} = \frac{b}{c+a} = \frac{c}{a+b} = \frac{a+b+c}{2(a+b+c)} = \frac{1}{2}$$

8. (B)

$$\text{Total man-hours} = 30 \times 7 \times 18 \quad \dots(1)$$

Let no. of days be 'x' then total man-hours is

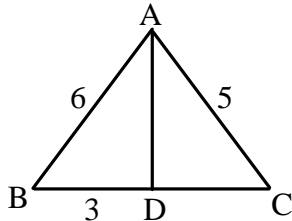
$$= x \times 21 \times 8 \quad \dots(2)$$

$$\Rightarrow (1) = (2) \quad (\text{as work is same})$$

$$x \times 21 \times 8 = 30 \times 7 \times 18$$

$$x = \frac{45}{2} = 22.5 \text{ days}$$

9. (B)



AD is the angle bisector

$$\text{Hence } \frac{AB}{AC} = \frac{BD}{CD}$$

$$CD = \frac{5}{6} \times 3 = \frac{5}{2} = 2.5$$

10. (B)

Akbar	Amar	Anthony
$x + 5000$	x	$x + 7000$

Total principle = $3x + 12000$

$$S \cdot I = \frac{(3x + 12000) \times 12 \times 1}{100} = 3240$$

$$\Rightarrow x = 5000$$

11. (D)

$$36^{120} = (36 \times 36^2)^{40}$$

$$\text{Hence } x = 6^4$$

12. (D)

$$\sin \theta_1 + \sin \theta_2 + \sin \theta_3 = 3 \Rightarrow \sin \theta_1 = \sin \theta_2 = \sin \theta_3 = 1$$

$$\Rightarrow \theta_1, \theta_2, \theta_3 \text{ are odd multiples of } \frac{\pi}{2}$$

13. (D)

L = no. of Lux soap cakes purchased

D = no of Dove soap cakes purchased

$$\Rightarrow \left. \begin{array}{l} 30L + 40D = 360 \\ 3L + 4D = 36 \end{array} \right\} \Rightarrow (L, D) = (8, 3)(4, 6)$$

14. (D)

Let no. of x then

$$445 = x \cdot k_1 + 4$$

$$572 = x \cdot k_2 + 5 \quad k_1, k_2, k_3 \text{ are integers}$$

$$699 = x \cdot k_3 + 6$$

$$\Rightarrow x \cdot k_1 = 441$$

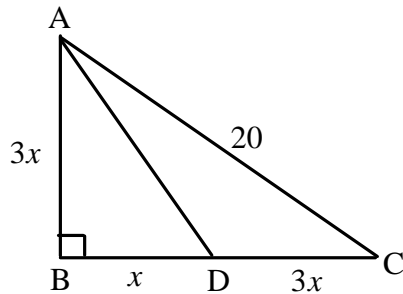
$$x \cdot k_2 = 567$$

$$x \cdot k_3 = 693$$

Hence x is the H.C.F. of 441, 567, 693

$$= 63$$

15. (D)



$$\Rightarrow (3x)^2 + (4x)^2 = 20^2$$

$$\Rightarrow 25x^2 = 25 \times 16$$

$$\Rightarrow x = 4$$

Hence $AD^2 = 4^2 + 12^2$

$$= 160$$

$$AD = 4\sqrt{10}$$

16. (A)

17. (A)

18. (C)

19. (A)

20. (D)

21. (B)

22. (A)

23. (A)

24. (A)

25. (B)

SECTION B : SOLUTION26. 55° Join AC $\Rightarrow \angle ACB = 90^\circ \Rightarrow \angle CAB = 55^\circ$.But $\angle BDC = \angle CAB$

As they are subtended by the same arc.

27. **2 cm** $x =$ in radius

$$= \frac{\Delta}{S}$$

$$= \frac{\frac{1}{2} \times 6 \times 8}{\left(\frac{8+6+10}{2} \right)}$$

$$= 2$$