

(A) ANSWERS:

1/ (b) Interior angle + Exterior angle = 180°

then Interior angle = Exterior angle = 108°

2 Interior angle = 288°

Interior angle = 144°

= 36°

Exterior angle = (180° - 144°) = 36°

∴ Number of sides = (360° / 36°) = 10

2/ (b) Let Original CP = 100x

SP = 105x

Now the present CP = 95x

SP = (105x - 2)

Profit = 95x of 10% = 9.5x

SP - CP = Profit

⇒ (105x - 2) - 95x = 9.5x

⇒ 105x - 95x - 9.5x = 2

⇒ x/2 = 2

⇒ x = 4

⇒ 100x = ₹ 400

3/ (c) cot 41°, cot 42°, cot 43° ... cot 49°

Now; (cot 41° · cot 49°) · (cot 42° · cot 48°) ... cot 45° →

[ Since tan(90° - θ) = cot θ; cot 45° = 1 ]

∴ (tan 49° · cot 49°) (tan 48° · cot 48°) ... cot 45° = 1

(9) MISCELLANEOUS

(A) : 1 = ANSWERS :- (8) A

1. (C) (P+R) → done in 1 day →  $\frac{7}{60}$  part of job  
 done in 6 days →  $\frac{7}{10}$

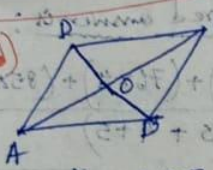
Remaining part of job =  $\frac{3}{10}$  →  $(3 \times \frac{10}{3}) = 10$  days

Now, P done 1 part of job in →  $(3 \times \frac{10}{3}) = 10$  days

$$Q = \frac{1}{\left(\frac{6 \times 10}{1}\right)} = 15 \text{ days}$$

$$R = \left(\frac{7}{60} - \frac{1}{15}\right) = 20 \text{ days}$$

$$\therefore (R-P) = (20 - 10) = \boxed{10 \text{ days}}$$

5. (A)   $AC = 24 \text{ cm}$ ;  $OC = 12 \text{ cm}$   
 Side of the rhombus =  $\left(\frac{60}{4}\right) = 15 \text{ cm}$

then, for  $\triangle COB$ ; right-angled at O.

$$OB = \sqrt{(15)^2 - (12)^2} = 9 \text{ cm}; \quad DB = 18 \text{ cm}$$

$$\text{Then, area of the rhombus is} = \left(\frac{1}{2} \times 24 \times 18\right) \text{ cm}^2 = \boxed{216 \text{ cm}^2}$$

6. (B) Ratio in which the money is to be divided among A, B and C :-

$$\frac{1}{(100 + R_1 t_1)} : \frac{1}{(100 + R_2 t_2)} : \frac{1}{(100 + R_3 t_3)}$$

$$= \frac{1}{110} : \frac{1}{115} : \frac{1}{120}$$

$$= \frac{1}{22} : \frac{1}{23} : \frac{1}{24} = (23 \times 24) : (22 \times 24) : (22 \times 23)$$

Now, 552 : 528 : 506

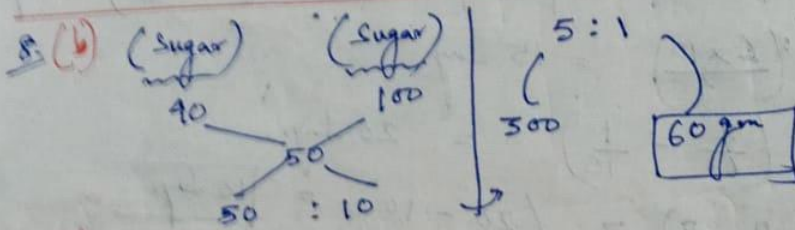
$$\therefore A's \text{ Share} = \left(\frac{552}{1586} \times 7930\right) = \boxed{\text{Rs } 2760}$$

(A) ANSWERS :-

Q. (b)  $\frac{60}{100} A = \frac{30}{100} B \Rightarrow A:B = 1:2 \rightarrow (i)$   
 $\frac{40}{100} B = \frac{20}{100} C \Rightarrow B:C = 2:5 \rightarrow (ii)$

Again,  $B = \frac{40}{100} C \Rightarrow B:C = 2:5$   
 Now,  $A:B:C = 1:2:5$

$\therefore C = \frac{x}{100} A \Rightarrow x = \frac{100C}{A} = \frac{100 \times 5x}{x}$   
 $= \boxed{500}$



Q. (a)  $A = \frac{B}{76} \Rightarrow 83$   
 $B = \frac{C}{85} \Rightarrow 81$   
 $C = \frac{A}{77} \Rightarrow 81$   
 $3 : 4 : 5$   
 Required answer is:  

$$\frac{(83 \times 3) + (76 \times 4) + (85 \times 5)}{(3 + 4 + 5)}$$

$$= \frac{978}{12} = \boxed{81.5}$$

10. (a) let B takes  $x$  hrs to fill the remaining tank

$\therefore$  According to the question:

$\frac{2}{6} + \frac{(x+2)}{8} = 1 \Rightarrow x = \left(\frac{16}{3} - 2\right)$   
 $\Rightarrow \frac{x+2}{8} = \frac{2}{3} \Rightarrow x+2 = \frac{16}{3}$   
 $\Rightarrow x = \frac{10}{3} = \boxed{3\frac{1}{3} \text{ hrs}}$

(A) = ANSWERS: - <10>

11. (d) Let CP = £100  
 SP = £90  
 Now, SP' = £120

Then,  $90 = 54$   
 $120 = \left( \frac{54}{90} \times 120 \right)$   
 $= \boxed{£72}$

12. (c) Let the monthly incomes of A and B be respectively  
 £8x and £5x.

∴ According to the question:

$$\frac{8x - 12,000}{5x - 10,000} = \frac{5}{3}$$

$$\Rightarrow 24x - 36,000 = 25x - 50,000$$

$$\Rightarrow x = 14,000$$

∴ Required answer

$$(8x - 5x) = 3x$$

$$= (3 \times 14,000)$$

$$= \boxed{£42,000}$$

13. (d)  $\left[ \sin 31^\circ \cos 59^\circ + \cos 31^\circ \sin 59^\circ \right] \div \left[ \cos 20^\circ \cos 25^\circ - \sin 20^\circ \sin 25^\circ \right]$

Let  $A = 31^\circ$ ,  $B = 59^\circ$  and  $x = 20^\circ$ ;  $y = 25^\circ$

$$\sin(A+B) = \sin A \cos B + \cos A \sin B$$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

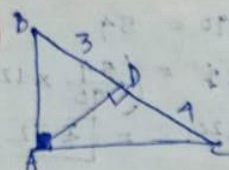
Now,  $\sin(31^\circ + 59^\circ) \div \cos(20^\circ + 25^\circ)$

$$= \sin 90^\circ \div \cos 45^\circ$$

$$= 1 \div \frac{1}{\sqrt{2}}$$

$$= \boxed{\sqrt{2}}$$

(A) ANSWERS :- (11) A

14. (a) 
 $\angle A = 90^\circ$   
 $\angle B + \angle C = 90^\circ$

Now, In  $\triangle ABD$   $\rightarrow \tan \angle B = \frac{AD}{BD} \Rightarrow \tan \angle B = \frac{AD}{3}$

Now, In  $\triangle ADC$   $\rightarrow \tan \angle C = \frac{AD}{DC} \Rightarrow \cot \angle B = \frac{AD}{4}$

$\tan \angle B \cdot \cot \angle B = 1$   $\Rightarrow \frac{AD}{3} \cdot \frac{AD}{4} = 1$

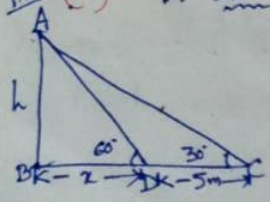
$\Rightarrow \frac{AD^2}{12} = 1$   $\Rightarrow AD = \sqrt{12} = 2\sqrt{3}$

15. (a)  $\frac{1}{(1-a)(1-b)(1-c)} + \frac{1}{(1-b)(1-c)(1-d)} + \frac{1}{(1-d)(1-a)(1-c)} + \frac{1}{(1-d)(1-c)(1-a)}$

Now, put  $a=2$ ;  $b=2$ ;  $c=0$ ;  $d=0$

$\frac{1}{(1-2)(1-2)(1+0)} + \frac{1}{(1-2)(1-2)(1-0)} + \frac{1}{(1-0)(1-2)(1-2)} + \frac{1}{(1-0)(1-0)(1-2)}$

$= 1 + (-1) + 1 + (-1) = 0$

16. (a) 
 $\therefore$  In  $\triangle ABD$   $\rightarrow \frac{AB}{BD} = \tan 60^\circ = \sqrt{3}$   
 $\Rightarrow \frac{h}{x} = \sqrt{3} \Rightarrow 2 = \frac{h}{\sqrt{3}} \rightarrow (i)$

In  $\triangle ABC$   $\rightarrow \tan 30^\circ = \frac{h}{(x+5)}$   
 $\Rightarrow \frac{1}{\sqrt{3}} = \frac{h}{(x+5)} \Rightarrow (x+5) = \sqrt{3}h \rightarrow (ii)$

From (i) and (ii)  $\rightarrow \frac{h + 5\sqrt{3}}{\sqrt{3}} = \sqrt{3}h \Rightarrow 2h = 5\sqrt{3} \Rightarrow h = \frac{5\sqrt{3}}{2}$

$\therefore$  Height =  $\frac{5\sqrt{3}}{2} \text{ m}$

(A) ANSWERS :- <12>

18 (c)  $2x^2 - 7xy + 3y^2 = 0$  [ Since,  $a = 2$ ,  $b = -7$  and  $c = 3$  ]  
 $\Rightarrow 2\left(\frac{x}{y}\right)^2 - 7\left(\frac{x}{y}\right) + 3 = 0$   
 $\therefore \frac{x}{y} = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} = \frac{7 \pm \sqrt{49 - 24}}{2 \times 2}$   
 $\therefore \frac{x}{y} = \frac{7 \pm 5}{4} = \boxed{3, \frac{1}{2}}$

18 (d)  $\frac{AB}{PQ} = \frac{\text{Perimeter of } \triangle ABC}{\text{Perimeter of } \triangle PQR}$   
 $\Rightarrow \frac{AB}{PQ} = \left(\frac{36}{24} \times 10\right) = \boxed{15 \text{ cm}}$

19 (b) Let the population of the village be  $100x$ .  
Now, Male =  $80x$  and Female =  $20x$   
 $\therefore$  Educated people =  $\left[\left(\frac{80 \times 95}{100}\right) + \left(\frac{20 \times 60}{100}\right)\right] \times 100$   
 $= 88x$   
 $\therefore$  The percentage is  $\rightarrow \boxed{88\%}$

20 (a) 

Appeared Students	$\rightarrow$	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
		40	50	60
Passed Students	$\rightarrow$	100% $\downarrow$ 40	90% $\downarrow$ 45	80% $\downarrow$ 48

  
 $\therefore$  Required Pass (%) =  $\frac{(40 + 45 + 48)}{(40 + 50 + 60)} \times 100$   
 $= \left(\frac{133}{150} \times 100\right)\% = \boxed{88\frac{2}{3}\%}$

**(A) ANSWERS :- (13)**

21. (a)  $(3^{123} - 3^{122} - 3^{121}) \times (2^{121} - 2^{120} - 2^{119})$   
 $= 3^{121} (3^2 - 3 - 1) \times 2^{119} (2^2 - 2 - 1)$   
 $= 3^{121} \times 5 \times 2^{119} \times 1$   
 $\therefore$  Number of Zeros in  $\boxed{1}$

22. (b) A : (B + C) = 1 : 2  $\rightarrow$  (i)  $\times 5$   
 B : (A + C) = 1 : 4  $\rightarrow$  (ii)  $\times 3$

$\therefore$  A : (B + C) = 5 : 10  $\rightarrow$  Total = 15 units  
 B : (A + C) = 3 : 12  $\rightarrow$  Total = 15 units

Now, A = 5 ; B = 3 ; C = 7  
 $\therefore$  Required Difference =  $11250 \times \frac{(5-3)}{15} = \boxed{1500}$

23. (b) Let the total profit be ₹ 100x.

According to the question:

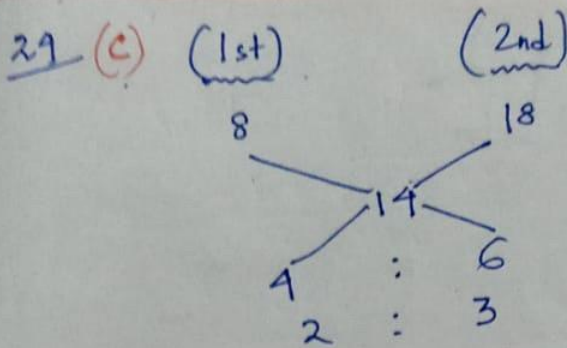
$95\% \times \frac{3}{5} = 8550$

$\Rightarrow x = 150$

$\Rightarrow 100x = \boxed{15,000}$

(A) ANSWERS :-

<19>



Quantity sold at  
8% profit :

$$\left(\frac{2}{5} \times 1000\right) = \boxed{400 \text{ kg}}$$

25. (b)  $\left(x - \frac{1}{x}\right) = 1$

$$\Rightarrow x^2 - 1 = x$$

$$\Rightarrow \left(x - \frac{1}{x}\right)^3 = 1$$

$$\Rightarrow x^3 - \frac{1}{x^3} - 3\left(x - \frac{1}{x}\right) = 1$$

$$\Rightarrow x^3 - \frac{1}{x^3} - 3\left(\frac{x^2 - 1}{x}\right) = 1$$

$$\Rightarrow x^3 - \frac{1}{x^3} = 4$$

$$\frac{x^3 - \frac{1}{x^3}}{3x^2 + 5x - 3}$$

$$= \frac{x\left(x^3 - \frac{1}{x^3}\right)}{3\left(x^2 - 1\right) + 5x}$$

$$= \frac{4x}{8x}$$

$$= \boxed{\frac{1}{2}}$$

X