

[A] ANSWERS : (6)

$$1. (b) \quad (m^{2a})^a = (m^{2^a})^2 \quad \Rightarrow 2a^2 = 2 \cdot 2^a$$

$$\Rightarrow m^{2a^2} = m^{2^a} \cdot m^{2^a} \quad \Rightarrow a^2 = 2^a$$

$$\Rightarrow m^{2a^2} = m^{2 \cdot 2} \quad \Rightarrow$$

2. (d) Let B alone can complete the work in x days.

$$\therefore \frac{2}{11} + \frac{2+x}{15} = 1 \quad \Rightarrow 4+2x = \frac{105}{11}$$

$$\Rightarrow \frac{2}{11} + \frac{1+2x}{15} = 1 \quad \Rightarrow 2x = \left(\frac{105}{11} - 4 \right)$$

$$\Rightarrow \frac{1+2x}{15} = \frac{7}{11} \quad \Rightarrow x = \frac{61}{22} = 2\frac{17}{22}$$

3. (b) Let $a = 7.33$; $b = 4.33$ and $(a-b) = 3$

$$\therefore \frac{a^3 + ab(a-b) - b^3}{a^2 - b^2} = \frac{a(a-b) + b(a-b)}{(a-b)}$$

$$= \frac{a^3 + a^2b - ab^2 - b^3}{a^2 - b^2} = \frac{(a-b)(a+b)}{(a-b)}$$

$$= \frac{a^3 - ab^2 + a^2b - b^3}{a^2 - b^2} = (7.33 + 4.33) = 11.66$$

4. (b) Value Ratio: $\rightarrow 13 : 5 : 7$

Coin Ratio: $\rightarrow 13 : 10 : 35$

$$\therefore \text{No of 50 paise coin} = \left(\frac{10}{58} \times 522 \right) = 90$$

[A] MISCELLANEOUS QUESTIONS :- <7>

5. (b) Avg. Speed = $\frac{\text{Total distance}}{\text{Total time}} = \frac{200 + 150 + 50}{2\frac{1}{2} + 2 + \frac{1}{2}}$
 $= \frac{400}{5} = \boxed{80 \text{ km/h}}$

6. (b) $A : B : C$
 $1\frac{1}{2} : 7\frac{1}{2} : 2$
 $\frac{3}{2} : \frac{15}{2} : 2$
 $3 : 15 : 4$
 $\therefore B's \text{ share} = \left(57244 \times \frac{15}{22}\right)$
 $= \boxed{\text{Rs } 39030}$

7. (b) $M_1 D_1 = M_2 D_2$
 $\Rightarrow 157 \times (36 - 3) = \frac{(157 + 32)}{63} \times D_L$
 $\Rightarrow 157 \times 33 = 189 \times D_L$
 $D_2 = \frac{1727}{63}$
 $D_2 = \boxed{27\frac{26}{63}}$

8. (b) $(x^2)^n = x^{2n}$ | $y^2 = y^{2m}$ | $(m+n)^{m+n}$
 $\Rightarrow x^{2n} = x^2$ | $\Rightarrow y^4 = y^{2m}$ | $= (2+1)^{2+1}$
 $\Rightarrow 2n = 2$ | $\Rightarrow 2m = 4$ | $= (3)^3 = \boxed{27}$
 $\Rightarrow n = 1$ | $\Rightarrow m = 2$

9. (b) Now, Speed (V_1) = $\left(\frac{300}{5}\right) \text{ K/h} = 60 \text{ K/h}$

$\therefore 12x = 60$
 $\Rightarrow x = 5$

$\Rightarrow 17x = 85(V_2)$

Relative speed $\therefore (V_1 + V_2) = (60 + 85) \text{ K/h} = 145 \text{ K/h}$
 $145 \text{ K/h} \rightarrow \left(145 \times \frac{5}{18}\right) \text{ m/s} \rightarrow \left(\frac{145 \times 5}{18}\right) \text{ m/s}$

According to the question:

$D = VT$

$\Rightarrow (250 + 250) = 145 \times \frac{5}{18} \times T$

$\Rightarrow \frac{500}{145} = \frac{25}{18} \times T$

$\Rightarrow T = \frac{360}{29} = \boxed{12\frac{12}{29} \text{ sec}}$

(A) ANSWERS (8)

10. (6) 18 banana = $\frac{3}{2}$ dozen banana

$$\therefore \text{SP of } \frac{3}{2} \text{ dozen of banana} = \left(\frac{3}{2} \times 12\right) = ₹ 18$$

$$\text{Now, SP of remaining part is } \rightarrow \left(\frac{3}{2} \times 4\right) = ₹ 6$$

$$\text{Total CP} = (18 \times 3) = ₹ 54$$

$$\text{Total SP} = (18 + 6) = ₹ 24$$

$$\text{Loss} = ₹ 30$$

$$\therefore \text{Loss (\%)} = \left(\frac{30}{54} \times 100\right) \% = \boxed{55\frac{5}{9} \%}$$

11. (c) A : B : C : D = $\left(\frac{1}{3} : \frac{1}{4} : \frac{1}{5} : \frac{1}{6}\right) = 20 : 15 : 12 : 10$

$$\therefore \text{Total} = (20 + 15 + 12 + 10) = 57$$

Now, 285 is divisible by 57.

$\therefore$ Required answer is $\boxed{57}$

12. (a) $\sqrt{x} + \frac{1}{\sqrt{x}} = 5$

$$\Rightarrow \left(\sqrt{x} + \frac{1}{\sqrt{x}}\right)^2 = 25$$

$$\Rightarrow x + \frac{1}{x} + 2 = 25$$

$$\Rightarrow \left(x + \frac{1}{x}\right) = 23$$

$$\Rightarrow \left(2 + \frac{1}{x}\right)^2 = (23)^2$$

$$\Rightarrow x + \frac{1}{x} + 2 = 529$$

$$\Rightarrow \left(x + \frac{1}{x}\right) = \boxed{527}$$

13. (b) Diameter = $2\sqrt{2}$ cm

Radius = $\sqrt{2}$ cm

height = $\sqrt{2}$ cm

Volume = $\pi r^2 h$

$$V = \frac{22}{7} \times (\sqrt{2})^2 \times \sqrt{2}$$

$$= \frac{44\sqrt{2}}{7} \text{ cm}^3$$

$$= \boxed{\frac{88}{7\sqrt{2}} \text{ cm}^3}$$

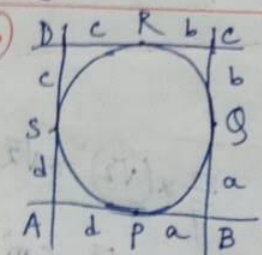
(A) ANSWERS :- <7>

14. (b) $5 \sin \theta - 12 \cos \theta = 0$ Now, $\frac{12 \sin \theta + 13 \cos \theta}{15 \sin \theta - 2 \cos \theta}$
 $\Rightarrow 5 \sin \theta = 12 \cos \theta$
 $\Rightarrow \frac{\sin \theta}{\cos \theta} = \frac{12}{5}$
 $\Rightarrow \tan \theta = \frac{12}{5}$
 $\Rightarrow \sin \theta = \frac{12}{13}$
 $\Rightarrow \cos \theta = \frac{5}{13}$
 $\Rightarrow \frac{12 \cdot 12K + 13 \cdot 5K}{15 \cdot 12K - 2 \cdot 5K}$
 $= \frac{209}{170}$

15. (b) $SI = \frac{P \times R \times T}{100}$
 $SI = \left(88 \times \frac{50}{100} \times \frac{1}{12} \right) \left[\because 16 \frac{1}{3} \% = \frac{50}{3} \% \right]$
 $= \boxed{21000}$

16. (a) $(ad-bc)^2 + (ac+bd)^2 = (c^2+d^2)(a^2+b^2)$
 $= a^2d^2 + b^2c^2 + a^2c^2 + b^2d^2 = (1 \times 2)$
 $= a^2d^2 + a^2c^2 + b^2c^2 + b^2d^2 = \boxed{2}$
 $= a^2(d^2+c^2) + b^2(c^2+d^2)$

17. (d) $0.1 \times 0.01 \times 0.001 \times 10^7$
 $= \left(\frac{1}{10} \times \frac{1}{100} \times \frac{1}{1000} \times 10^7 \right) \Rightarrow \frac{10^7}{10^6} \Rightarrow \boxed{10}$

18. (b) 
 Now, $BP = BQ = a \rightarrow (i)$
 $QC = CR = b \rightarrow (ii)$
 $RD = DS = c \rightarrow (iii)$
 $SA = AP = d \rightarrow (iv)$

$AB + CD = (a+d+b+c) = (a+b+c+d)$

$AD + BC = (d+c+a+b) = (a+b+c+d)$

$\therefore \frac{AB+CD}{CB+DA} = \boxed{1}$

(A) ANSWERS (10)

17. (d) Let the numbers are $9a$ and $9b$.
 a and b co-prime each other.

∴ According to the question:

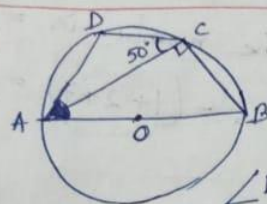
$$(9a + 9b) = 99$$

$$\Rightarrow (a + b) = 11$$

a	b	
1	10	→ (i)
2	9	→ (ii)
3	8	→ (iii)
4	7	→ (iv)
5	6	→ (v)

5 pairs

20. (c)



$$\angle A + \angle C = 180^\circ$$

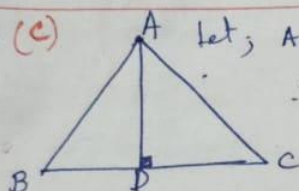
$$\text{Now, } \angle DCB = (70^\circ + 50^\circ)$$

$$= 120^\circ$$

$$\angle DAB + \angle DCB = 180^\circ$$

$$\Rightarrow \angle DAB = 40^\circ$$

21. (c)



Let, $AB = BC = CA = x$ cm

$$\therefore AB + BC + CA = 3x$$

$$\text{Now, } AD = \text{height} = \frac{\sqrt{3}}{2}x$$

$$\therefore 4D = \left(4 \times \frac{3}{4}x\right) = 3x$$

$$\text{then we can say that; } AB + BC + CA = 4AD$$

22. (d) We know that; $\angle A + \angle B + \angle C = 180^\circ$

$$\text{Let } \angle A = 60^\circ; \angle B = 90^\circ; \angle C = 30^\circ$$

$$\therefore \sin\left(\frac{B+C}{2}\right) = \sin 60^\circ = \frac{\sqrt{3}}{2}$$

$$\text{Now, According to the option; we can say } \cos \frac{A}{2} = \cos 30^\circ$$

$$= \frac{\sqrt{3}}{2}$$

Then, option (d) satisfied the given condition.

The Required answer is $\cos \frac{A}{2}$

(A) ANSWERS :- (11)

$$\begin{aligned} 23. (a) & \sqrt{8-4\sqrt{3}} \\ &= \sqrt{(\sqrt{6})^2 + (\sqrt{2})^2 - 2 \cdot \sqrt{6} \cdot \sqrt{2}} \\ &= \sqrt{(\sqrt{6} - \sqrt{2})^2} \\ &= \boxed{\sqrt{6} - \sqrt{2}} \end{aligned} \left[\begin{array}{l} \because \text{let } a = \sqrt{6} \\ b = \sqrt{2} \\ \therefore a^2 + b^2 - 2ab = (a-b)^2 \end{array} \right]$$

$$24. (a) (2272 - 875) = 1397$$

$$\begin{array}{r} 11 \overline{) 1397} \\ \underline{127} \\ 127 \\ \underline{0000} \\ 0000 \end{array}$$

$\therefore$ The number is = 127

$$\therefore \text{Sum of the digit is} = (1+2+7) = \boxed{10}$$

$$25. (c) 5\frac{3}{x} \times 3\frac{1}{2} = 19$$

$$\Rightarrow \frac{5x+3}{x} \times \frac{7}{2} = 19$$

$$\Rightarrow (35x + 21) = 38x$$

$$\Rightarrow 3x = 21$$

$$\Rightarrow \boxed{x = 7}$$

~~19 = 35 + 21 + 38~~