J ANSWER KEY

1. (b)	**2.** (c)	**3.** (a)	**4.** (c)	**5.** (a)	**6.** (c)	**7.** (c)	**8.** (c)	**9.** (c)	**10.** (b)
11. (c)	**12.** (d)	**13.** (a)	**14.** (a)	**15.** (d)	**16.** (b)	**17.** (a)	**18.** (a)	**19.** (a)	**20.** (b)
21. (b)	**22.** (a)	**23.** (a)	**24.** (b)	**25.** (c)					

HINT & SOLUTIONS

1. **7 दिन के लिए = 56 किग्रा०**

1 दिन के लिए = 8 किग्रा०

$$\text{April} + \text{May} = 30 + 31 = 61$$

$$\text{total} = 61 \times 8 = 488 \text{ किग्रा०}$$

2.

Mp (Market price)		**Cp (Cost Price)**
100 + P%		100 – *D*%
100 + 15	:	100 – 20%
115	:	80
23	:	16

Cp : Mp = 16 : 23

3.

	Car Ist	**:**	**Car 2nd**
Distance	80 km	:	180 km
Time	2 hrs	:	3 hrs

$$\text{Speed} = \frac{80}{2} : \frac{180}{3}$$

$$40 : 60$$

$$2 : 3$$

4. $\mathbf{2.5\% = \frac{1.5}{1000}}$ $\mathbf{\frac{1 \to Distance}{40 \to Mp}}$

Mp	Sp
40	39

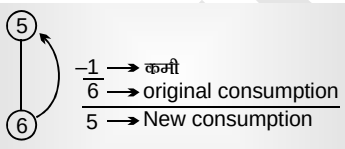
$$40 \text{ unit} \to 3600 \text{ रु०}$$

$$1 \text{ unit} \to 90 \text{ रु०}$$

$$\text{Sp} = 39 \text{ unit} \to = 39 \times 90$$

$$= 3510 \text{ रु०}$$

5. $\mathbf{20\% = \frac{1}{5}}$



पहले भी 120 रु० खर्च करता था, अभी भी 120 रु० खर्च करता है।

$$1 \text{ unit} \to 4 \text{ किग्रा०}$$

$$\text{orignal} = 6 \text{ unit} \to 24 \text{Kg}$$

$$\text{orignal price} = \frac{120}{24} = 5 \text{रु०/किग्रा०}$$

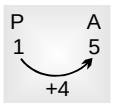
6. $\mathbf{1 + 2 + 3 + \ldots + 10 \text{ km}}$

$$\Sigma n = \frac{n}{2}[a + l]$$

$$= 102(1 + 10)$$

$$= \frac{10}{2} \times 11 = 55 \text{ किग्रा०}$$

7.



$$r\% = \frac{\text{कितना बढ़ा}}{\text{कितने पर} \times \text{समय}} \times 100\%$$

$$= \frac{4}{1 \times 8} \times 100$$

$$= 50\%$$

8. $\mathbf{a^2 + b^2 + c^2 = 83}$

$$a + b + c = 15$$

$$ab + bc + ca = ?$$

$$(a + b + c)^2 = a^2 + b^2 + c^2 + 2bc + 2ca$$

$$(15)^2 = 83 + 2(ab + bc + ca)$$

$$225 - 83 = 2(ab + bc + ca)$$

$$142 = 2(ab + bc + ca)$$

$$71 = ab + bc + ca$$

9. $\mathbf{(\sqrt{3} + 1)^2 = x + \sqrt{3}y}$

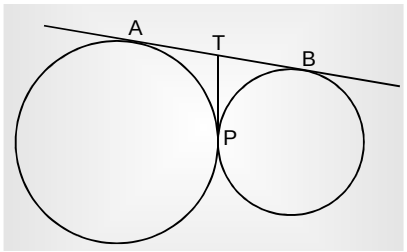
$$3 + 1 + 2\sqrt{3} = x + \sqrt{3}y$$

$$4 + \sqrt{3}.2 = x + \sqrt{3}y$$

$$x = 4,\ y = 2$$

$$x + y = 4 + 2 = 6$$

10.

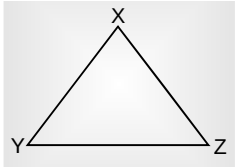


एक बिन्दु से वृत्त पर दो ही स्पर्श रेखा खीचीं जा सकती है तथा दोनों की लम्बाई बराबर होती है।

$$TA = TP \quad \& \quad TB = TP$$

$$\therefore \quad TA = TB$$

11.



(1) दो भुजाओं का योग > तीसरी भुजा

$$xy + yz > zx$$

(2) दो भुजाओं का अन्तर < तीसरी भुजा

$$xy - zy < \times z$$

12. $\sin(3x - 20^\circ) = \cos(3y + 20^\circ)$

If $\sin A = \cos B$

$$A + B = 90^\circ$$

$$3x - 20^\circ + 3y + 20^\circ = 90^\circ$$

$$3(x + y) = 90^\circ$$

$$x + y = 30^\circ$$

13. Let संख्या $= x$

$$\left(x + \frac{1}{2}\right) \times 3 = 21$$

$$x + \frac{1}{2} = 7$$

$$x = 6.5$$

14. $M + T + W + T = 48^\circ \times 4$ ...(i)

$\underline{T + W + T + F = 52^\circ \times 4}$ ...(ii)

(i)—(ii)

$$M - F = (48^\circ - 52^\circ) \times 4$$

$$M - F = -4^\circ \times 4$$

$$42^\circ - F = -4 \times 4$$

$$F = 42 + 16$$

$$F = 58^\circ$$

15. $m - n = 2$

$m \times n = 15$

Put the value and get the answer—

$$m = 5, \quad n = 3$$

$(m^2 - n^2)(m^3 - n^3)$

$(5^2 - 3^2)(5^3 - 3^3)$

$(25 - 9) \times (125 - 27)$

$$16 \times 98 = 1568$$

16. $p = 9, Q = \sqrt{17}$

$(p^2 - q^2)^{-1/3}$

$$p^2 = 81, q^2 = 17$$

$$(p^2 - Q^2)^{-1/3} = \sqrt[3]{\frac{1}{(p^2 - Q^2)}}$$

$$= \sqrt[3]{\frac{1}{(81 - 17)}}$$

$$= \sqrt[3]{\frac{1}{64}} = \frac{1}{4}$$

17. $(5y + 62^\circ)$ & $(22^\circ + y)$

संपूरक (supplementary)

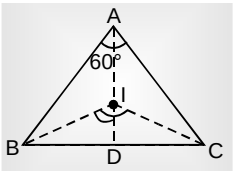
$$5y + 62 + 22^\circ + y = 180^\circ$$

$$6y + 84^\circ = 180^\circ$$

$$6y = 96^\circ$$

$$y = 16^\circ$$

18.

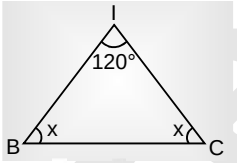


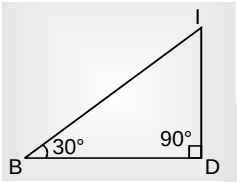
∵ केन्द्र पर बना कोण परिधि पर बने कोण का दोगुना होता है।

$$\therefore \quad \angle BIC = 2 \times \angle BAC$$

$$\angle BIC = 120^\circ$$

$$\because \quad BI = IC = R \quad \text{(परिवृत्त की त्रिज्या)}$$





$$120 + 2x = 180$$

$$x = 30^\circ$$

$$\angle BID = 180 - (30 + 90^\circ)$$

$$= 180 - 120^\circ$$

$$= 60^\circ$$

19. $\frac{\cos\alpha}{\cos\beta} = m, \quad \frac{\cos\alpha}{\sin\beta} = n$ $(m^2 + n^2)\cos^2\beta$

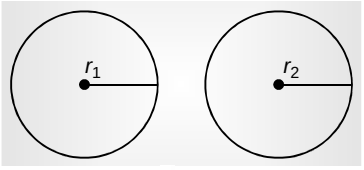
$$= \left(\frac{\cos^2\alpha}{\cos^2\beta} + \frac{\cos^2\alpha}{\sin^2\beta}\right)\cos^2\beta$$

$$= \cos^2\alpha\left(\frac{1}{\cos^2\beta} + \frac{1}{\sin^2\beta}\right)$$

$$= \frac{\cos^2\alpha(\sin^2\beta + \cos^2\beta)}{\cos^2\beta.\sin^2\beta}\cos^2\beta$$

$$= \frac{\cos^2\alpha}{\sin^2\alpha} = \left(\frac{\cos\alpha}{\sin\beta}\right)^2 = n^2$$

20.



भार (weight) = द्रव्यमान (mass) × घनत्व (density)

$$W = m \times g$$

$$\downarrow$$

volume × प्रति सेमी^{3} द्रव्यमान

$$\frac{8}{27} = \frac{\frac{4}{3}\pi r_1^3 \times 8}{\frac{4}{3}\pi r_2^3 \times 1}$$

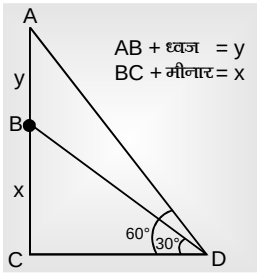
$$\frac{8}{27} = \frac{r_1^3}{r_2^3} \times \frac{8}{1}$$

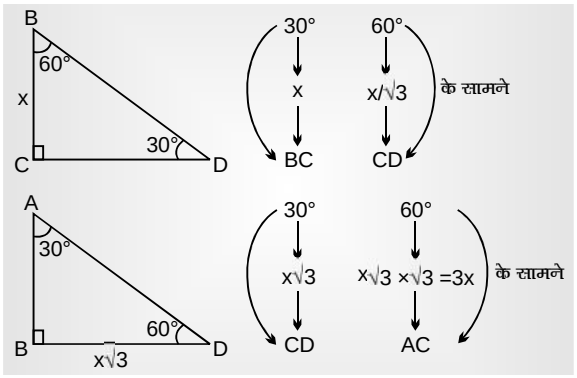
$$\frac{r_1^3}{r_2^3} = 127$$

$$\frac{r_1}{r_2} = \sqrt[3]{\frac{1}{27}} = \frac{1}{3}$$

$$r_1 : r_2 = 1 : 3$$

21.





A.T.Q.

$$CD = 9 \text{ mtr}$$

$$\Rightarrow \quad x\sqrt{3} = 9 \Rightarrow x = \frac{9}{\sqrt{3}}$$

$$x = \frac{9}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$= 3\sqrt{3}$$

$$AB + BC = AC$$

$$y + x = 3x$$

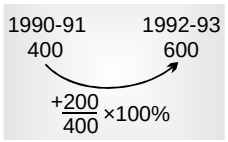
$$y = 2x$$

$$y = 6\sqrt{3}$$

22-25 DI :

22. Arts

23.



$$= \frac{1}{2} \times 100\%$$

$$= \frac{1}{2} \times 100\%$$

$$= 50\%$$

24.

	Comerce	**Law**
1990-91	200	150
1991-92	250	200
1992-93	250	250
total	700	600

7 : 6

25. 1992-93 में Art में minimum student रहे।