QUANTITATIVE ABILITY - 77 (SOLUTION)

1. (C)

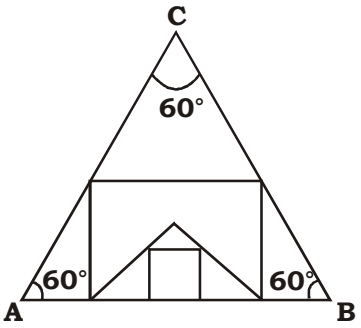


Fig.(i)

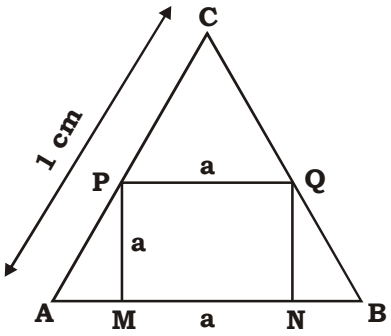


Fig.(ii)

PCQ is also an equilateral triangle.

PC = PQ = PM = a

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

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

$$AC = AP + PC = \frac{2a}{\sqrt{3}} + a = 1$$

$$a = \frac{\sqrt{3}}{\left(2+\sqrt{3}\right)} = \sqrt{3}\left(2-\sqrt{3}\right)$$

Now, in figure (iii)

PM = MT = a

Let the each side of square RSYX be K, then RT = K also (since RTS is an equilateral triangle)

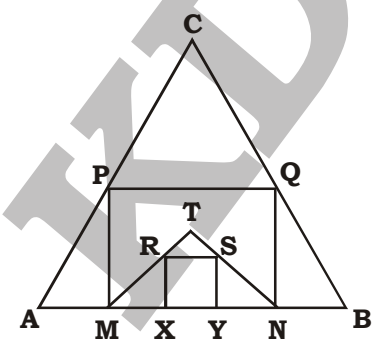


Fig.(iii)

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

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

$MT = RT + RM = K + \frac{2K}{\sqrt{3}}$

$MT = \frac{\left(\sqrt{3}+2\right)}{\sqrt{3}}K$

But, MT = a

$a = \left(\frac{\sqrt{3}+2}{\sqrt{3}}\right)K$

$K = \frac{\sqrt{3}\,a}{\left(\sqrt{3}+2\right)}$

But, $a = \sqrt{3}\left(2-\sqrt{3}\right)$

$K = \frac{\sqrt{3}a}{\left(\sqrt{3}+2\right)}\left[\sqrt{3}\left(2-\sqrt{3}\right)\right]$

$K = \frac{3\left(2-\sqrt{3}\right)^2}{1} = 3\left(7-4\sqrt{3}\right)$

$\therefore$ Area of square RSYX = $K^2 = \left[3\left(7-4\sqrt{3}\right)\right]^2$

$K^2 = \left[9\left(49+48-56\sqrt{3}\right)\right]$

$K^2 = \left(873-504\sqrt{3}\right)cm^2$

2. (A) $\angle ACB = 60°$ $(\because \angle ACB + \angle ADB = 180°)$

And $\angle CAB = 30°$ $(\because \angle ACB + \angle CAB = 90°)$

$AC = 2 \times 6 = 12\ cm^2$

$\frac{BC}{AC} = \sin 30° = \frac{1}{2}$

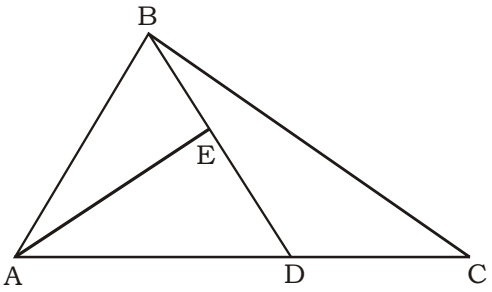
BC = 6 cm

And $\frac{BC}{AB} = \tan 30° = \frac{1}{\sqrt{3}}$

$AB = 6\sqrt{3}\ cm$

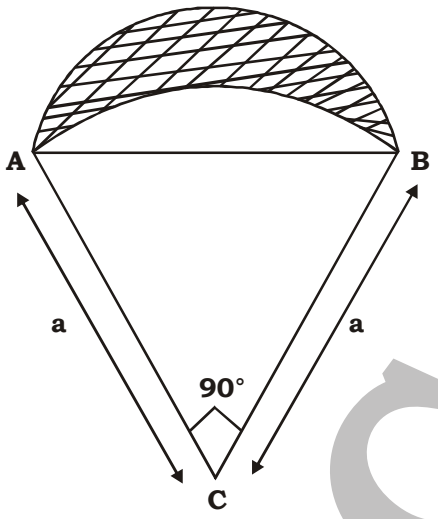
Area of $\Delta ABC = \frac{1}{2} \times 6 \times 6\sqrt{3} = 18\sqrt{3}\ cm^2$

3. (A)



Area of $\Delta BAE = \frac{1}{4}AC \times \frac{1}{3}BD = \frac{1}{12}$ Area of ΔABC

4. (C)



Area of quadrant = $\frac{1}{4}\pi a^2$

Area of triangle ACB = $\frac{a^2}{2}$

Area of segment = $\frac{\pi a^2}{4} - \frac{a^2}{2} = \frac{a^2}{4}(\pi - 2)$

Area of semi-circle = $\frac{1}{2}\pi\left(\frac{a\sqrt{2}}{2}\right)^2 = \frac{\pi a^2}{4}$

Area of shaded region = $\pi a^2 - \frac{a^2}{4}(\pi - 2) = \frac{a^2}{2}$ sq unit

5. (D) Let the original speed be s km/h, scheduled time = t hours and total distance = D km

Then, $s \times t = \frac{3}{4}D$ ....(i)

And $s \times (t + 3) = D$ ....(ii)

From equation (i) and (ii), we get

$st = \frac{3}{4}[s(t+3)]$

$t = 9$ h

And let $s = 1$ km/h, then $D = 12$ km

Again, since he doubles his speed after k hours then,

$s_1t_1 + s_2t_2 = D$

$1 \times k + 2 \times (9 - k) = 12$

$k = 6$ h

6. (B) **In ideal case:**

Time taken to fill the tank by A and B = $\frac{50}{41.66} = \frac{6}{5}$ hours

Time taken by A, B and C to fill rest half of the tank = $\frac{50}{16.66}$ = 3 hours

Total time = $\frac{6}{5} + 3$ = 4 hours 12 minutes

In second case :

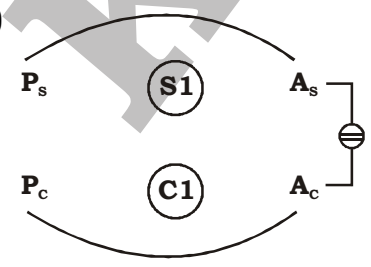
Time taken to fill $\frac{3}{4}$ tank by A and B = $\frac{75}{41.66} = \frac{9}{5}$ hours

Time taken by A, B and C to fill rest $\frac{1}{4}$ tank = $\frac{25}{16.66} = \frac{3}{2}$ hours

Total time = $\frac{9}{5} + \frac{3}{2}$ = 3 hours 18 minutes

Therefore, difference in time = 54 minutes

7. (A)



Obviously, $P_S > P_C$, therefore percentage gain of P_c is greater than P_S.

8. (A)

Rice	**Wheat**
25	9
× x	× 5x
25x	45x

70x = 350

x = 5

Hence, the price of Rice = ₹ 5 per kg

Price of wheat = ₹ 25 per kg

Now, the price of wheat = ₹ 30 per kg

Let the new amount of Rice be M kg, then

M × 5 + 9 × 30 = 350

M = 16

Hence decrease (in%) of amount of rice = $\frac{25-16}{25}\times 100 = 36\%$

9. (A) Priti = $\frac{5}{6}$Lucky .....(i)

and Ravi = Raghav = $\frac{9}{10}$Priti .....(ii)

Also Priti = $\frac{2}{3}$Priya .....(iii)

And Priya – Lucky = 3

From (i) and (iii),

$\frac{\text{Lucky}}{\text{Priya}} = \frac{4}{5}$

Priya = $\frac{5}{4}$Lucky .....(v)

Priya – Lucky = $\frac{5\text{Lucky}}{4}$ – Lucky = 3

From (iv) and (v),

Lucky = 12 and Priya = 15 and Priti = 10

Also Ravi = Raghav = 9 and Bharat = 11, since Priti < Bharat < Lucky and Bharat is integer

∴ Lucky : Bharat = 12 : 11

10. (A) Let there be n people (initially) in the group, then the total earning of the group = n × 50

Again, n × 50 = (n – 2) × 49 + (2x + 45)

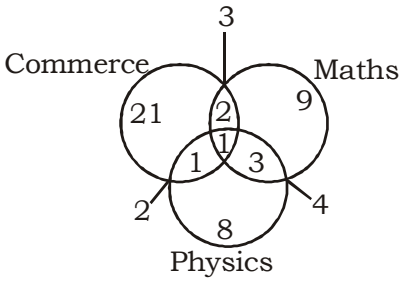
n = 2x – 53;

where x is lowest earning of any person.

Now, since 42 < x < 47 and n ∈ prime numbers

Then the only possible value of n = 37 for x = 45

11. (A)



Total students who are studying at least one subject = 21 + 1 + 2 + 1 + 9 + 3 + 8 = 45
Number of students, who are not studying any of the three subjects = 80 – 45 = 35

12. (A) Number of workers = x and number of officers = y

Case : (I)

$x + y = 400$ ..... (i)

Case : (II)

$2000 \times x + 10000 \times y = 400 \times 3000$

$$x + 5y = \frac{400 \times 3000}{2000}$$

$x + 5y = 600$ ..... (ii)

Subtracting (ii) from (i),

$(x + 5y) - (x + y) = 200$

$y = 50$

Number of officers = $y = 50$

Number of workers = $x = 400 - 50 = 350$

13. (A) Let their ages be x and y.

ATQ,

$$\frac{1}{x} + \frac{1}{y} = 5\left(\frac{1}{x} - \frac{1}{y}\right)$$

$y + x = 5(y - x)$

$6x = 4y$

$$\frac{x}{y} = \frac{2}{3}$$ ..... (i)

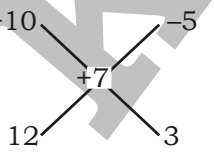
Now, $\frac{xy}{x+y} = \frac{14.4}{1}$

$xy = 14.4(x + y)$ ..... (ii)

From Equation (i) and (ii),

$x = 24$ years and $y = 36$ years

14. (D) By the rule of alligation,



Quantity of rice sold at 10% gain = $\frac{12}{12+3} \times 50 = 40$ kg

Quantity of rice sold at 5% loss = $\frac{3}{12+3} \times 50 = 10$ kg

15. (A) Let x represents number of students and y represents the number of rows.
Then,

Number of students in each row = $\frac{x}{y}$

Case : (I)

$\left(\frac{x}{y}+4\right) \times (y-2) = x$

$2y^2 - 4y = x$ ..... (i)

Case : (II)

$\left(\frac{x}{y}-4\right) \times (y+4) = x$

$y^2 + 4y = x$ .....(ii)

From equation (i) and (ii),

$2y^2 - 4y = y^2 + 4y$

$y(y-8) = 0$

$y = 8$

Total number of students

$x = 2(8)^2 - 4 \times 8 = 128 - 32 = 96$

16. (C) Mohan can reach the middle in 12.5 minute

Puran can reach the middle in 25 minute

So, required time = 25 – 12.5 = 12.5 minute

17. (B) Number of men = $\frac{2}{5} \times 25 = 10$

Number of women= $\frac{3}{5} \times 25 = 15$

Amount distributed among men and women = 275 × 80% = ₹ 220

Let the wages paid to a man be ₹ $5x$ and to a woman be ₹ $4x$, then

$10 \times 5x + 15 \times 4x = 220$

$50x + 60x = 220$

$x = 2$

$\therefore$ Wages received by a woman = 2 × 4 = ₹ 8

18. (A) According to question,

$\left(8\frac{1}{2}\% - 5\%\right)$ of sum = 350

Sum = $\frac{350}{3.5} \times 100$ = ₹ 10000

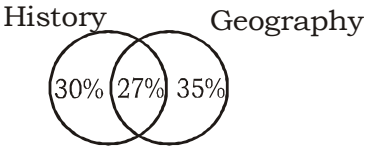
19. (B)

		Anu	**Bimla**
Investment	⟶	₹ 5000	₹ 6000
₹ 880 Profit	12.5% ⟶	₹ 110	
	87.5% ⟶	₹ 350	₹ 420
		₹ 110 + ₹ 350 = ₹ 460	
		₹ 770	

Profit received by Anu = ₹ 110 + ₹ 350 = ₹ 460

Profit received by Bimla = ₹ 420

20. (B) Venn–Diagram of Failed Students



Percentage of failed students = 30% + 35% – 27% = 38%

Percentage of passed students = 100% – 38% = 62%

Now, Let total number of students be x

ATQ,

62% of x = 248

$\therefore \quad x = 248 \times \frac{100}{62} = 400$

21. (C) Let the maximum marks be x.

ATQ,

296 – 259 = 5% of x

$\frac{5}{100}x = 37$

$x = 740$

22. (D) Only the option (D) gives the difference of votes between two candidates as 308.

23. (B) Let the cost price of colour printer and computer system be ₹ x and ₹ y respectively.

According to question,

$x \times \frac{120}{100} + y \times \frac{90}{100} = x + y$

$0.2x = 0.1y$ ..... (i)

$x \times \frac{85}{100} + y \times \frac{105}{100} = x + y - 800$

$0.05y = 0.15x - 800$

From equations (i) and (ii),

x = ₹ 16000

24. (B) $\frac{x}{\sqrt{8}} = \frac{2\sqrt{3}}{\sqrt{3}+\sqrt{2}}$

On applying componendo and dividendo,

$$\frac{x+\sqrt{8}}{x-\sqrt{8}} = \frac{3\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} \quad \text{..... (i)}$$

Again,

$$\frac{x}{\sqrt{12}} = \frac{2\sqrt{2}}{\sqrt{3}+\sqrt{2}}$$

$$\frac{x+\sqrt{12}}{x-\sqrt{12}} = \frac{3\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}} \quad \text{..... (ii)}$$

From Equation (i) + Equation (ii),

$$\frac{x+\sqrt{8}}{x-\sqrt{8}} + \frac{x+\sqrt{12}}{x-\sqrt{12}} = \frac{3\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} - \frac{3\sqrt{2}+\sqrt{3}}{\sqrt{3}-\sqrt{2}}$$

$$= \frac{3\sqrt{3}+\sqrt{2}-3\sqrt{2}-\sqrt{3}}{\sqrt{3}-\sqrt{2}} = \frac{2(\sqrt{3}-\sqrt{2})}{\sqrt{3}-\sqrt{2}} = 2$$

25. (C) $x^2 + \frac{1}{x^2} + 2 = 3$

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

$x^4 + 1 = x^2$

$\therefore \quad x^4 - x^2 + 1 = 0$

Now,

$x^{206} + x^{200} + x^{90} + x^{84} + x^{18} + x^{12} + x^6 + 1$

$= x^{200}(x^6 + 1) + x^{84}(x^6 + 1) + x^{12}(x^6 + 1) + 1(x^6 + 1)$

$= (x^6 + 1)(x^{200} + x^{84} + x^{12} + 1)$

$= (x^2 + 1)(x^4 - x^2 + 1)(x^{200} + x^{84} + x^{12} + 1) = 0$

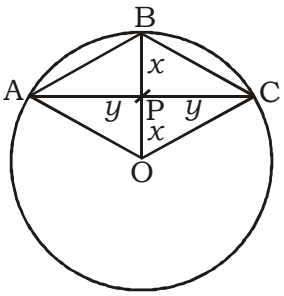
26. (A) $a^3 + b + c^3 - 3abc$

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

$$\therefore \quad \frac{a^3 - b^3 + c^2 - 3abc}{a + b + c} = \frac{\frac{1}{2}(a + b + c)\{(a-b)^2 + (b-c)^2 + (c-a)^2\}}{(a + b + c)}$$

$$= \frac{1}{2}(3^2 + 5^2 + 1^2) = \frac{1}{2} \times 35 = 17.5$$

27. (B)



OABC is a rhombus with centre O.

Let diagonal of the rhombus be OB = $2x$ and AC = $2y$

Radius of the circle = OB = OA = OC = $2x$

In ΔPOC,

$OC^2 = OP^2 + PC^2$

$(2x)^2 = x^2 + y^2$

$4x^2 = x^2 + y^2$

$3x^2 = y^2 \Rightarrow x = \frac{y}{\sqrt{3}}$

Also, area of rhombus = $\frac{1}{2} \times (2x)(2y) = 32\sqrt{3}$

$x = 4$

$\therefore$ Radius of circle = 2 × 4 = 8 m

28. (C) $a \sin\theta + b \cos\theta = c$

On squaring,

$a^2 \sin^2\theta + b^2 \cos^2\theta + 2ab \sin\theta \cos\theta = c^2$ .....(i)

Let $a \cos\theta - b \sin\theta = k$

$a^2 \cos^2\theta + b^2 \sin^2\theta - 2ab \sin\theta \cos\theta = k^2$ .....(ii)

From equation (i) & (ii),

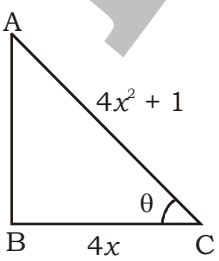
$a^2(\sin^2\theta + \cos^2\theta) + b^2(\sin^2\theta + \cos^2\theta) = c^2 + k^2$

$k^2 = a^2 + b^2 - c^2$

$k = \pm\sqrt{a^2 + b^2 - c^2}$

29. (D) $\sec\theta = \frac{4x^2 + 1}{4x}$

$\therefore$ $b = 4x$, $h = 4x^2 + 1$



Then,

$P = \sqrt{(4x^2+1)^2-(4x)^2} = \sqrt{16x^4+8x^2+1-16x^2}$

$= \sqrt{16x^4-8x^2+1} = 4x^2 - 1$

$\therefore \quad \sec\theta + \tan\theta = \frac{4x^2+1}{4x} + \frac{4x^2-1}{4x}$

$= \frac{4x^2+1+4x^2-1}{4x} = \frac{8x^2}{4x} = 2x$

30. (B) $\cos\theta\left(\frac{1}{1-\sin\theta}+\frac{1}{1+\sin\theta}\right) = 4$

$\cos\theta\left(\frac{1+\sin\theta+1-\sin\theta}{1-\sin^2\theta}\right) = 4$

$\cos\theta\left(\frac{2}{\cos^2\theta}\right) = 4$

$\cos\theta = \frac{1}{2}$

$\cos\theta = \cos 60°$

$\theta = 60°$

31. (B) $(a^2 - b^2)\sin\theta + 2ab\cos\theta = a^2 + b^2$

$\frac{a^2-b^2}{a^2+b^2}\sin\theta + \frac{2ab}{a^2+b^2}\cos\theta = 1$

Let $\frac{a^2-b^2}{a^2+b^2} = \sin\theta$ & $\frac{2ab}{a^2+b^2} = \cos\theta$

Then, above equation becomes

$\sin^2\theta + \cos^2\theta = 1$

$\sin\theta = \frac{a^2-b^2}{a^2+b^2}$

$\cos\theta = \frac{2ab}{a^2+b^2}$

$\therefore \quad \tan\theta = \frac{a^2-b^2}{2ab} = \frac{1}{2ab}(a^2 - b^2)$

32. (D) $\frac{\cos^4\alpha}{\cos^2\beta} + \frac{\sin^4\alpha}{\sin^2\beta} = 1$

By taking $\alpha = \beta$, it satisfies the above equation

$\therefore \quad \frac{\cos^4\beta}{\cos^2\alpha} + \frac{\sin^4\beta}{\sin^2\alpha} = 1$

33. (B) $l\cos^2\theta + m\sin^2\theta = \dfrac{\cos^2\theta}{\cot^2\theta}\left(\dfrac{1+\sin^2\theta}{\sin^2\theta}\right)$

$l\cos^2\theta + m - m\cos^2\theta = 1 + 1 - \cos^2\theta$

$l\cos^2\theta + \cos^2\theta - m\cos^2\theta = 2 - m$

$\cos^2\theta = \dfrac{2-m}{l-m+1}$

$\sec^2\theta = \dfrac{l-m+1}{2-m}$

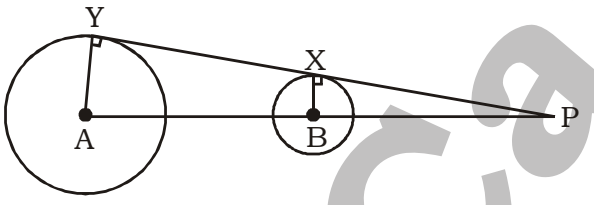
$\tan^2\theta + 1 = \dfrac{l-m+1}{2-m}$

$\tan^2\theta = \dfrac{l-m+1-2+m}{2-m}$

$\tan^2\theta = \dfrac{l-1}{2-m}$

$\therefore \tan\theta = \sqrt{\dfrac{l-1}{2-m}}$

34. (D)



In ΔAPY and ΔBPX,

$\angle X = \angle Y = 90°$

A tangent is always perpendicular to the radius through the point of contact.

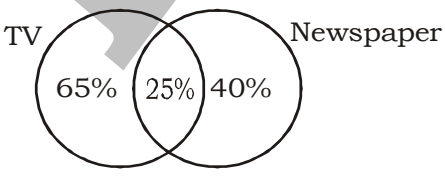
$\Delta APY \sim \Delta BPX$ [By AA similarity]

$\therefore \dfrac{AY}{BX} = \dfrac{AP}{PB}$

$\dfrac{5}{2} = \dfrac{AP}{PB}$

P divides AB externally in the ratio of 7 : 2.

35. (D)



Number of people who either watch TV or read newspaper = (65 + 40 – 25)% = 80%

Number of people who neither watch TV nor read newspaper = (100 – 80)% = 20%

36. (C) Total work = 124 × 120 = 14880

Work completed in 64 days = $\frac{2}{3}$ × 14880 = 9920

Remaining work for remaining 60 days = (14880 – 9920) = 4960

ATQ,

$$\frac{M_1D_1}{W_1} = \frac{M_2D_2}{W_2}$$

$$\frac{120\times64}{9920} = \frac{M_2\times60}{4960}$$

M_2 = 64

Number of workmen who can be reduced =120 – 64 = 56

37. (B) When a value is first increased and then decreased by the same percentage, then the initial value is always decreased by $\frac{x^2}{100}$%. (irrespective of initial value)

So, loss percent = $\frac{(15)^2}{100}$ = 2.25%

38. (B) Given,

$$\frac{x}{2x+y+z} = \frac{y}{x+2y+z} = \frac{z}{x+y+2z} = a$$

$\therefore$ $x = a(2x + y + z)$, $y = a(x + 2y + z)$

$z = a(x + y + 2z)$

$x + y + z = a(4x + 4y + 4z)$

$4a = 1$

$a = \frac{1}{4}$

39. (C) Let length and breadth of blackboard be x m and $(x – 8)$ m respectively.

ATQ,

$x \times (x – 8) = (x + 7)(x – 12)$

$x^2 – 8x = x^2 – 5x – 84$

$x = \frac{84}{3} = 28$ cm

Length = 28 cm

Breadth = $x – 8$ = 20 m

40. (A) Total area of two parks = $\pi(8^2 + 6^2) = 100\pi$

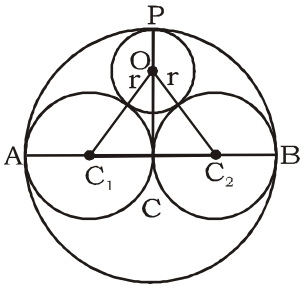
Area of bigger park = $\pi \times 100$

$\pi \times r^2 = \pi \times 100$

$r^2 = 100$

$\therefore$ r = 10 m

41. (C) In ΔOC_1C_2,



$(OC_1)^2 = (OC)^2 + (CC_1)^2$

$(r + 1)^2 = (PC - OP)^2 + 1$

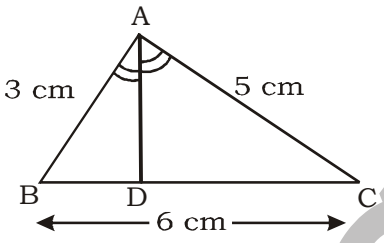
$(r + 1)^2 = (2 - r)^2 + 1$

$r^2 + 1 + 2r = 4 + r^2 - 4r + 1$

$6r = 4$

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

42. (B)



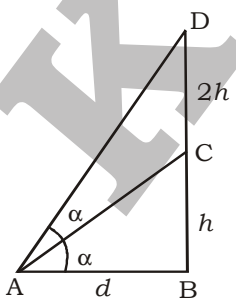
$\frac{BD}{AB} = \frac{DC}{AC}$

$\frac{BD}{DC} = \frac{3}{5}$

BD : DC = 3 : 5

Now, BD = $\frac{3}{(3+5)} \times 6 = \frac{18}{8}$ = 2.25 cm

43. (C)



Let BC = h be the height of the pillar, then CD = $2h$.

Also, let $\angle BAC = \angle CAD = \alpha$ and AB = d

In ΔABC,

$\tan\alpha = \frac{h}{d}$

And in ΔABD,

$\tan 2\alpha = \frac{3h}{d}$

$\frac{2\tan\alpha}{1-\tan^2\alpha} = \frac{3h}{d}$

$\frac{\frac{2h}{d}}{1-\left(\frac{h}{d}\right)^2} = \frac{3h}{d}$

$\frac{2}{3} = 1 - \left(\frac{h}{d}\right)^2$

$\frac{h}{d} = \frac{1}{\sqrt{3}}$

$h : d = 1 : \sqrt{3}$

44. (A) $t - 2 = \sqrt[3]{4} + \sqrt[3]{2}$

$(t-2)^3 = 4 + 2 + 3\sqrt[3]{4}\sqrt[3]{2}(\sqrt[3]{4} + \sqrt[3]{2})$

$t^3 - 2^3 - 3 \times 2 \times t(t-2) = 6 + 6t - 12$

$t^3 - 6t^2 + 6t - 2 = 0$

45. (D) Let leakage alone can empty the full cistern in x h.
ATQ,

$\frac{\frac{9}{2} \times x}{x - \frac{9}{2}} = 5$

$\frac{9}{2}x = 5x - \frac{45}{2}$

$\frac{1}{2}x = \frac{45}{2}$

$x = 45$ hours

46. (D) Let the two digits number be $10x + y$.
Two digits number in reverse order = $10y + x$
According to question,

$10 \times 2x + \frac{y}{2} = 10y + x$

$20x - x = 10y - \frac{y}{2}$

$19x = \frac{19y}{2}$

$\frac{x}{y} = \frac{1}{2}$

Unit's digit is two times the ten's digits.

47. (C) Let P and Q be any number say, P = 17 and Q = 9.
Again, let divisor = 5

Clearly, r_1 ⇒ 5) 17 (3 | P + Q = 26
−15
⇒ $r_1 = 2$ 2 | 5) 26 (5
−25
Also, 5) 9 (1 | 1
−5
4 | $r_3 = 1$
⇒ $r_2 = 4$

Divisor = $5 = r_1 + r_2 - r_3$
$5 = 2 + 4 - 1 = 5$

48. (B) Let the two digits number be A and B.
According to question,
35% of A + B = 120% of B
35A = 20B

$$\frac{A}{B} = \frac{20}{35} = \frac{4}{7}$$

B : A = 7 : 4

49. (D) Let the five numbers be x, y, z, u, and v
According to question,
$x + y + z + 6 = u + v$ .....(i)
$x + y + z = 2uv$ .....(ii)
From (i) and (ii),
$2u + 6 = u + v$
$v - u = 6$
Neither u nor v can be calculated with the help of the above relation.

50. (B) Let the cost of 1 orange = ₹ x
Let the cost of 1 apple = ₹ $1.75x$
ATQ,

$$\frac{40}{1.75x} + \frac{16}{x} = 14$$

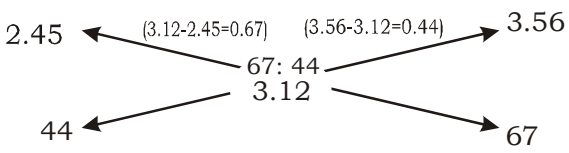
$40 + 16 \times 1.75 = 14 \times 1.75 \times x$
$40 + 28 = 24.5\,x$

$$x = ₹\ \frac{68}{24.5}$$

Cost of 1 apple = $\frac{1.75 \times 68}{24.5}$

Number of apples = $\frac{40 \times 24.5}{17.5 \times 68} = 8.24 = 8$ (approx.)

51. (B) Mechanical Electronic



Atleast 67 electronic graduates should be there to fulfill the conditions given in the question.

52. (C) Cost of painting on Monday = ₹ x

Cost of painting on Tuesday = ₹ $x + 3y$

Cost of painting on Wednesday = ₹ $x + 2y$

Cost of painting on Thursday = ₹ $x + y$

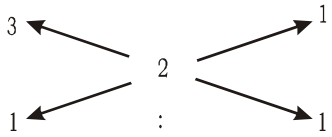
Cost of painting on Friday = ₹ $x + 2y$

Average daily earning $= \frac{5x+8y}{5} = x+\frac{8}{5}y$

53. (B)

	Sugar	Water		Sugar		Water
1st Solution	15	85	⇒	3	:	17
2nd Solution	5	95		1	:	19
Desired Solution				1	:	9

By Allegation:-



∴ 20 litres of 1st solution must be mixed with equal quantity of 2nd solution to make sugar 10% in total mixture

54. (D) Ratio of the students in the states A and C appearing for exam in 1998 = 3 : 6 = 1 : 2

As the increment in the next year is same for the student of both the states.

∴ The number of students who appeared in the state A in 1998 = any one of them – 3, 6, 9, 12 etc.

55. (B) Let the number of children be n.

Number of note books each child have = $\frac{1}{8}n$

ATQ,

$\frac{1}{2}n \times 16 = n \times \frac{1}{8}n$

$8n = \frac{n^2}{8}$

$n = 64$

Number of note books distributed = $64 \times \frac{1}{8} \times 64 = 512$

56. (A) Total Price of component = ₹ 50,000

Expected rejection = 5% = ₹ 2,500

Remaining = ₹ 47,500 = C.P. + 25% Profit

C.P. = ₹ 38,000

But, 50% goods rejected, so he was paid 50% of 50,000, i.e. ₹ 25,000

So, Loss = ₹ 38000 – ₹ 25,000 = ₹ 13,000

57. (D) 10 M + 15 W = 6 days

$\therefore$ 60 M + 90 W = 1 days ..... (i)

100 M = 1 day ..... (ii)

60 M + 90 W = 100M

4M = 9 W

$\therefore$ $1\ M = \frac{9}{4}W$

$10\ M = \frac{45}{2}W$

$\frac{45}{2}W + 15\ W = 6$ days

$\frac{75}{2}\ W = 6$ days

1 W = 225 days

58. (B) Suppose women take x hours to complete the work.

Then child will complete in $(x + 15)$ hrs.

According to question,

$$\frac{18}{x+15}\text{work} + \left(\frac{6}{x}\right)\text{work} = \frac{3}{5}$$

$$\frac{18x+6(x+15)}{x(x+15)} = \frac{3}{5}$$

$3x^2 + 45x = 90x + 30x + 450$

$x^2 - 30x + 5x + 180 = 0$

$x(x - 30) + 5(x - 30) = 0$

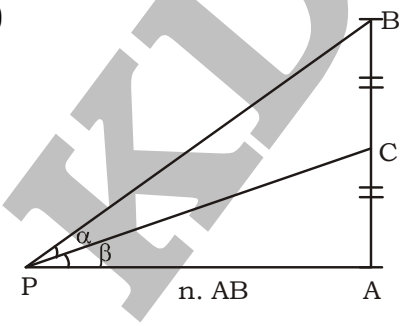
$(x + 5)(x - 30) = 0$

$x = 30$

1 work is completed by a women in 30 hours

$\therefore$ $\frac{2}{5}$ work is completed by a women in $\frac{2}{5} \times 30 = 12$ hours

59. (A)



AP = n AB

Now,

$$\tan\beta = \frac{\frac{AB}{2}}{AP} = \frac{\frac{AB}{2}}{n.AB} = \frac{1}{2n}$$ ..... (i)

Now,

$$\tan(\alpha+\beta) = \frac{AB}{AP} = \frac{AB}{n.AB} = \frac{1}{n}$$

$$\frac{\tan\alpha+\tan\beta}{1-\tan\alpha.\tan\beta} = \frac{1}{n}$$

$$\frac{\tan\alpha+\frac{1}{2n}}{1-\tan\alpha.\frac{1}{2n}} = \frac{1}{n}$$

$$\frac{2n\tan\alpha+1}{2n-\tan\alpha} = \frac{1}{n}$$

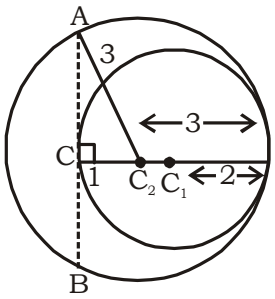
$$2n^2\tan\alpha+n = 2n-\tan\alpha$$

$$2n^2\tan\alpha+\tan\alpha = 2n-n$$

$$\tan\alpha\,[2n^2+1] = n$$

$$\therefore \quad \tan\alpha = \frac{n}{2n^2+1}$$

60. (B)



C_1 = Centre of small circle
C_2 = Centre of bigger circle

$AB = 2AC = 2 \times 2\sqrt{2} = 4\sqrt{2}$ cm

61. (A) $\text{cosec}\,\theta - \sin\theta$ m and $\sec\theta - \cos\theta$ = n

Now,

$$m = \text{cosec}\,\theta - \sin\theta = \frac{1}{\sin\theta} - \sin\theta$$

$$m = \frac{\cos^2\theta}{\sin\theta}$$

$$n = \sec\theta - \cos\theta$$

$$n = \frac{1-\cos^2\theta}{\cos\theta} = \frac{\sin^2\theta}{\cos\theta}$$

$$\therefore \quad (m^2n)^{2/3} + (mn^2)^{2/3}$$

$$= \left(\frac{\cos^4\theta}{\sin^2\theta}\times\frac{\sin^2\theta}{\cos^2\theta}\right)^{2/3} + \left(\frac{\cos^2\theta}{\sin\theta}\times\frac{\sin^4\theta}{\cos^2\theta}\right)^{2/3}$$

$$= (\cos^3\theta)^{2/3} + (\sin^3\theta)2/3$$

$$= \sin^2\theta + \cos^2\theta = 1$$

62. (A) $a\sec\theta + b\tan\theta + c = 0$

$p\sec\theta + 9\tan\theta + r = 0$

$$\frac{\sec\theta}{br-9c} = \frac{\tan\theta}{cp-ar} = \frac{1}{aq-bp}$$

$$\sec\theta = \frac{br-cp}{aq-bp}$$

and $\tan\theta = \frac{cp-ar}{aq-bp}$

Now,

$\sec^2\theta - \tan^2\theta = 1$

$$\left(\frac{br-cq}{aq-cq}\right)^2 - \left(\frac{cp-ar}{aq-bp}\right)^2 = 1$$

$(br - cq)^2 - (cp - ar)^2 = (aq - bp)^2$

63. (D) $\frac{\cos^4\alpha}{\cos^2\beta} + \frac{\sin^4\alpha}{\sin^2\beta} = 1$

$\cos^4\alpha.\sin^2\beta + \sin^4\alpha.\cos^2\beta = \cos^2\beta.\sin^2\beta$

$\cos^4\alpha(1 - \cos^2\beta) + \cos^2\beta(1 - \cos^2\alpha)^2 = \cos^2\beta(1 - \cos^2\beta)$

$\cos^4\alpha - \cos^4\beta.\cos^2\beta - 2\cos^2\alpha.\cos^2\alpha + \cos^4\alpha.\cos^2\beta = \cos^2\beta - \cos^4\beta$

$\cos^4\alpha - 2\cos^2\alpha.\cos^2\beta + \cos^4\beta = 0$

$(\cos^2\alpha - \cos^2\beta)^2 = 0$

$\cos^2\alpha = \cos^2\beta$

$1 - \sin^2\alpha = 1 - \sin^2\beta$

$\sin^2\alpha = \sin^2\beta$

$\therefore \frac{\cos^4\beta}{\cos^2\alpha} + \frac{\sin^4\beta}{\sin^2\alpha}$

$$\frac{\cos^2\beta\cos^2\alpha}{\cos^2\alpha} + \frac{\sin^2\beta\sin^2\alpha}{\sin^2\alpha}$$

$\cos^2\beta + \sin^2\beta = 1$

64. (A) Required average $= (70 + 80 + 66 + 58 + 76 + 64) \times \frac{50}{100\times 6}$

$$= \frac{414\times 50}{600} = 34.5$$

65. (A) Required total $= 150 \times \frac{65}{100} + 100 \times \frac{68}{100} + 50 \times \frac{66}{100} + 100 \times \frac{69}{100} + 125 \times \frac{80}{100} + 50 \times \frac{80}{100}$

$= 97.5 + 68 + 33 + 69 + 100 + 40 = 407.5$

66. (D) Total marks of Jitu in all the subjects together

$= 150 \times \frac{60}{100} + 100 \times \frac{74}{100} + 50 \times \frac{62}{100} + 100 \times \frac{54}{100} + 125 \times \frac{60}{100} + 50 \times \frac{64}{100}$

$= 90 + 74 + 31 + 54 + 75 + 32 = 356$

$\therefore$ Required % $= \left(\frac{356}{575} \times 100\right)\% = 61.91\% \approx 62\%$

67. (B) Marks obtained by Lucky in chemistry $= 150 \times \frac{85}{100} = 127.5$

Physics $= 125 \times \frac{70}{100} = 87.5$

Marks obtained by Priti in Chemistry $= 150 \times \frac{65}{100} = 97.5$

Physics $= 125 \times \frac{80}{100} = 100$

Marks obtained by Alka in Chemistry $= 150 \times \frac{70}{100} = 105$

Physics $= 125 \times \frac{60}{100} = 75$

Marks obtained by Javed in Chemistry $= 150 \times \frac{80}{100} = 120$

Physics $= 125 \times \frac{90}{100} = 112.5$

Marks obtained by Bipin in Chemistry $= 150 \times \frac{90}{100} = 135$

Physics $= 125 \times \frac{70}{100} = 87.5$

Marks obtain by Jitu in Chemistry $= 150 \times \frac{60}{100} = 90$

Physics $= 125 \times \frac{60}{100} = 75$

Only Javed is to be pas the examination.

68. (C) Total means obtained by Priti in all the subjects together

$= 150 \times \frac{85}{100} + 100 \times \frac{62}{100} + 50 \times \frac{72}{100} + 100 \times \frac{68}{100} + 125 \times \frac{70}{100} + 50 \times \frac{70}{100}$

$= 127.5 + 62 + 36 + 68 + 87.5 + 35 = 416$

Similarly by

Alka $= 150 \times \frac{70}{100} + 100 \times \frac{72}{100} + 50 \times \frac{68}{100} \times 100 \times \frac{78}{100} + 125 \times \frac{60}{100} + 50 \times \frac{66}{100}$

$= 105 + 72 + 34 + 78 + 75 + 33 = 397$

Javed = $150 \times \frac{80}{100} + 100 \times \frac{78}{100} + 50 \times \frac{76}{100} + 100 \times \frac{82}{100} + 125 \times \frac{90}{100} + 50 \times \frac{58}{100}$

= 120 + 78 + 38 + 82 + 112.5 + 29 = 459.5

Bipin = $150 \times \frac{90}{100} + 100 \times \frac{80}{100} + 50 \times \frac{72}{100} + 100 \times \frac{66}{100} + 125 \times \frac{70}{100} + 50 \times \frac{76}{100}$

= 135 + 80 + 36 + 66 + 87.5 + 38 = 442.5

Jitu = 356

∴ Required answer is Javed.

69. (B) $\sqrt{2+\sqrt{2+\sqrt{2+2\cos^8\theta}}}$

$= \sqrt{2+\sqrt{2+\sqrt{2+2\cos^2 4\theta - 1)}}}$ $[\because \cos^2\theta = 2\cos^2\theta - 1]$

$= \sqrt{2+\sqrt{2+\sqrt{4\cos^8 4\theta}}} = \sqrt{2+\sqrt{2+2\cos 4\theta}}$

$= \sqrt{2+\sqrt{2+2(2\cos^2 2\theta - 1)}} = \sqrt{2+\sqrt{4\cos^2 2\theta}}$

$= \sqrt{2+2\cos 2\theta} = \sqrt{2+2(\cos^2\theta - 1)}$

$= \sqrt{4\cos^2\theta} = 2\cos\theta$

70. (C) $\cos\theta = \frac{1}{2}\left(a+\frac{1}{a}\right)$

Squaring both sides,

$\cos^2\theta = \frac{1}{4}\left[\left(a+\frac{1}{a}\right)^2\right]$

$2\cos^2\theta = \frac{1}{2}\left[\left(a+\frac{1}{a}\right)^2\right]$

Subtracting 1 from both sides,

$2\cos^2\theta - 1 = \frac{1}{2}\left[\left(a+\frac{1}{a}\right)^2\right] - 1$

$2\cos^2\theta - 1 = \frac{1}{2}\left(a^2+\frac{1}{a^2}+2\right) - 1$

$2\cos^2\theta - 1 = \frac{1}{2}\left(a^2+\frac{1}{a^2}\right) + 1 - 1$

$2\cos^2\theta - 1 = \frac{1}{2}\left(a^2+\frac{1}{a^2}\right)$

71. (D) $a = \sin\frac{\pi}{4} = \frac{1}{\sqrt{2}}$

$b = \cos\frac{\pi}{4} = \frac{1}{\sqrt{2}}$

$c = -\operatorname{cosec}\frac{\pi}{4} = -\sqrt{2}$

$a + b + c = \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}} - \sqrt{2} = \sqrt{2} - \sqrt{2} = 0$

$a^3 + b^3 + c^3 = 3abc$ $[\because a + b + c = 0]$

$= 3 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}(-\sqrt{2}) = \frac{-3}{2}\sqrt{2}$

72. (D) Multiplying

$a^x.a^y.a^z = (x + y + z)^{x+y+z}$

$a^{(x+y+z)} = (x + y + z)^{x+y+z}$

$a = x + y + z$

73. (A) $\frac{1}{1+a^2-a} - \frac{1}{1+a^2+a} - \frac{2a}{1+a^2+a^4}$

$= \frac{1+a^2+a-1-a^2+a}{(a+a^2)^2-a^2} - \frac{2a}{1+a^2+a^4}$

$= \frac{2a}{1+a^4+a^2} + \frac{2a}{1+a^2+a^4} = 0$

74. (A) $\frac{p}{b-c} = \frac{q}{c-a} = \frac{r}{a-b}$

P = k(b – c), $q = k(c - a)$, $r(a - b)$

then, $p + q + r$

$= k\,(b - c + c - a + a - b) = 0$

75. (A) $pqr = 1$

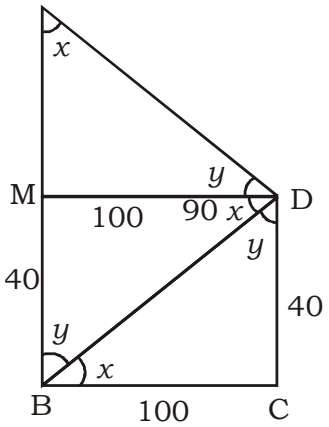
$\therefore \quad p = \frac{1}{qr}$ and $\frac{1}{p} = qr$

$\frac{1}{1+\frac{1}{qr}+\frac{1}{q}} + \frac{1}{1+q+\frac{1}{r}} + \frac{1}{1+r+qr}$

$= \frac{qr}{qr+q+1} + \frac{r}{qr+r+1} + \frac{1}{qr+r+1}$

$= \frac{qr+r+1}{qr+r+1} = 1$

76. (C)



From ΔBDC since $\angle y = 90^\circ - x$

$\therefore$ $\angle ADM = y$

In ΔBDC,

$$\frac{x}{y} = \frac{40}{100} \quad \text{.....(i)}$$

In ΔADM,

$$\frac{x}{y} = \frac{100}{AM} \quad \text{.....(ii)}$$

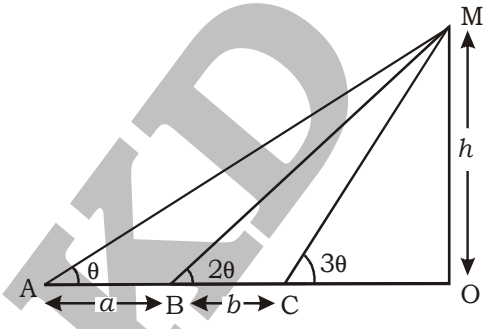
From (i) and (ii),

$$\frac{40}{100} = \frac{100}{AM}$$

AM = 250 m

Now, AB = 250 + 40 = 290 m

77. (C) Let angle of elevation for A, B and C are θ, 2θ and 3θ. (According to given condition we choose that)



From ΔPAB,

$2\theta = \theta + \angle APB$

$\angle APB = \theta$

$\therefore$ $\angle PAB = \angle ABP = \theta$

AB = BP = a

Similarly, in ΔBPC,

$\angle BPC = \theta$

From ΔOBP, $\sin 2\theta = \frac{h}{a}$

$h = a \sin 2\theta$

$h.2a \sin\theta \cos\theta$ .....(i)

From ΔPBC,

$\frac{PB}{\sin(180-30)} = \frac{BC}{\sin\theta}$ (by sine rule)

$\frac{a}{\sin 3\theta} = \frac{b}{\sin\theta}$

$\frac{a}{b} = \frac{\sin 3\theta}{\sin\theta}$

$\frac{a}{b} = \frac{3\sin\theta - 4\sin^3\theta}{\sin\theta}$

$\frac{a}{b} = 3 - 4\sin^2\theta$

$4\sin^2\theta = 3 - \frac{a}{b}$

$\sin^2\theta = \frac{3b-a}{4b}$

$\sin\theta = \sqrt{\frac{3b-a}{4b}}$ ($\cos^2\theta = 1 - \sin^2\theta$)

$\cos^2\theta = 1 - \frac{3b-a}{4b} = \frac{a+b}{4b}$

$\cos\theta = \sqrt{\frac{a+b}{4b}}$

Putting value of $\sin\theta$ and $\cos\theta$ in (i), we get

$h = 2a\sqrt{\frac{3b-a}{4b}}.\sqrt{\frac{a+b}{4b}}$

$h = \frac{a}{2b}\sqrt{(a+b)(3b-a)}$

78. (B) The number of candidates taking SSC exam in the year 2013 = $\frac{272}{17} \times 48 = 768$

The number of candidates taking SSC exam in the year 2016 = $\frac{272+238}{20} \times 32 = 816$

$\therefore$ Required ratio = 768 : 816 = 16 : 17

79. (D) Total number of candidates in the year 2012 = $4000 \times \frac{110}{100} = 4400$

And the total number of candidates in the year 2014 = $4000 \times \frac{110}{100} \times \frac{90}{100} \times \frac{110}{100} = 4356$

$\therefore$ Required difference = 4400 – 4356 = 44

80. (D) Let the total number of candidates in the year 2016 = 100

Total number of candidates in the year 2013 = 70

$\therefore$ Required% = $\left[\frac{100 \times \frac{20}{100}}{70 \times \frac{48}{100}} \times 100\right]\% = 59.52\% \approx 60\%$

81. (C) Required average% = $\frac{15+20+35+40+45+48}{6}$

= 33.83% ≈ 34%

82. (C) The number of candidates taking SSC exam in the year 2012 = $\frac{436}{20} \times 45 = 981$

The number of candidates taking SSC exam in the year 2014 = $\frac{520}{40} \times 45 = 585$

$\therefore$ Required more% = $\left(\frac{981-585}{585} \times 100\right)\%$

= 67.69% ≈ 68% more

83. (C) Man : Day : Time = work

117 : 33 : 8 = $\frac{4}{7}$

x : 13 : 9 = $\frac{3}{7}$

$x = \frac{117 \times 33 \times 8 \times 3}{13 \times 9 \times 4}$

$= \frac{92664}{468} = 198$

$\therefore$ Required number = 198 – 117 = 81

84. (C) Ratio of the amount of water filled in the cistern = $1^2 : \frac{16}{9} : 4 = 9 : 16 : 36$

36 cubic unit of water is filled by the pipe of largest diameter in 61 minutes.

1 cubic unit of water is filled by the pipe of largest diameter in $61 \times \frac{36}{61}$

61 cubic unit of water is filled by the pipe largest diameter in $\frac{61 \times 36}{61}$ = 36 minutes

85. (C) Time taken by pipe B (to empty) is less than the time taken by pipe A (to fill)

Rate of empty > Rate of filling

Now, Time required to empty the $\frac{2}{5}$th of the tank already filled when both the pipe A and B are opened together = $\frac{2}{5} \times \left(\frac{10 \times 6}{10-6}\text{minutes}\right)$ = 6 minutes

86. (D) **Logical solution**:-

Let the initial no. of total passengers = x

Initial ratio of male to female passengers = 3 : 1 (Given)

Initial no. of total passengers (x) must be completely divisible by 4.

($\because$ 3 + 1 = 4) ..... condition (i)

Also, change in the number of initial passengers = (–16 + 6) = –10

And Finally no. of male to female passengers = 2 : 1

Final number of total passengers (i.e. x – 10) must be completely divisible by 3.

($\because$ 2 + 1 = 3) ..... condition (ii)

And among the options given only option (D) = 64 fulfills both the criteria.

87. (A)

	1st	:	2nd	:	3rd
Ratio of fares =	8	:	6	:	3

New ratio = $8 \times \frac{5}{6} : 6 \times \frac{11}{12} : 3$

$= \frac{20}{3} : \frac{11}{2} : 3 = 9 : 12 : 26$

Ratio of passanger = 9 : 12 : 26

Collection from 1st class:

$\frac{60}{60+66+78} \times 1088 = \frac{65280}{204}$ = ₹ 320

88. (A) Given that:

Average age of 11 yrs players = 28 years

$\therefore$ Total age of players = 11 × 28 = 308 years

Now, Total ages of three groups = [3 × 25 + 3 × 28 + 3 × 30] = 249 years

Difference in their ages = (308 – 249) = 59 years

This will be the average of captain age and younger player age.

Now, As per question = 59 – 11 = 48 = sum of their ages

Average = $\frac{48}{2}$ = 24

$\therefore$ Age of Captain = 24 + 11 = 35 years

89. (B) Given that

$$\frac{1}{x+1} + \frac{2}{y+2} + \frac{1009}{z+1009} = 1 \quad \text{.... (i)}$$

Then,

$$\frac{x}{(x+1)} + \frac{y}{(y+2)} + \frac{z}{(1009+z)} \quad \text{.... (ii)}$$

Now,

x, y and z are distributed or divided over 1.

$\therefore$ $x = \frac{1}{3}$, $y = \frac{1}{3}$ and $z = \frac{1}{3}$ .... (iii)

From equation (i) and (ii), we conclude that

$x = 2$, $y = 4$ and $z = 2 \times 1009$ [from equation (i)]

Then the arrangement will divide into three parts.

Now, putting the value of following in equation (A)

$$\frac{2}{(2+1)} + \frac{4}{(4+2)} + \frac{2\times1009}{2\times1009+1009}$$

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

90. (D) $x + \frac{1}{x} = p$

Squaring both side,

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

$$x^2 + \frac{1}{x^2} + 2 = p^2$$

$$x^2 + \frac{1}{x^2} = p^2 - 2$$

cubic both sides,

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

$$x^6 + \frac{1}{x^6} + 3(p^2 - 2) = p^6 - 8 - 6p^2 + 12p$$

$$x^6 + \frac{1}{x^6} = p^6 - 9p^2 + 12p - 2$$

91. (B) $x^2 + Px - 4 = 0[-4]$

Putting $x = -4$ in above equation:-

$(-4)^2 - 4P - 4 = 0$

$16 - 4 = 4P$

$P = 3$

Now,

$x^2 + Px + q = 0$ [Equal roots]

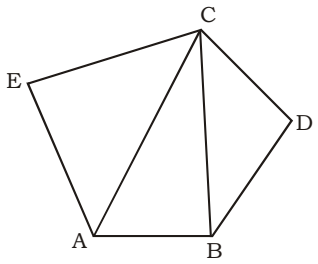
Discriminant = 0

$P^2 - 4q = 0$ [$D = b^2 - 4ac$]

$4q = p^2$

$$q = \frac{p^2}{4} = \frac{9}{4}$$

92. (D)



Let the side of right isosceles triangle = a unit

Now,

In ΔBCD [equilateral triangle]

$$\text{Height} = \frac{\sqrt{3}}{2}a$$

$$\text{Area } (\Delta BCD) = \frac{1}{2} \times b \times h = \frac{1}{2} \times a \times \frac{\sqrt{3}}{2}a = \frac{\sqrt{3}}{4}a^2 \text{ sq. unit} \quad \text{.....(i)}$$

In equilateral (ΔAEC)

$$\text{Side} = \sqrt{a^2 + a^2} = a\sqrt{2} \text{ unit}$$

$$\text{Height} = \frac{\sqrt{3}}{2} \times a \times \sqrt{2} = \frac{\sqrt{6}}{2}a$$

$$\text{Area } (\Delta AEC) = \frac{1}{2} \times b \times h = \frac{1}{2} \times a\sqrt{2} \times \frac{\sqrt{6}}{2}a$$

$$= \frac{\sqrt{12}}{4}a^2 = \frac{2\sqrt{3}}{4} \quad \text{.....(ii)}$$

$$\text{Now, } \frac{ar(\Delta BCD)}{ar(\Delta AEC)} = \frac{\frac{\sqrt{3}}{4}a^2}{\frac{2\sqrt{3}}{4}a^2} = \frac{1}{2} = 1 : 2$$

93. (C) $x\left[3-\frac{2}{x}\right]=\frac{3}{x},\ x\neq 0$

$3x-2=\frac{3}{x}$

$3x-\frac{3}{x}=2$

Squaring both sides,

$9x^2+\frac{9}{x^2}-18=4$

$9\left[x^2+\frac{1}{x^2}\right]=22$

$\left[x^2+\frac{1}{x^2}\right]=\frac{22}{9}=2\frac{4}{9}$

94. (A) Initial amount of mixture = $8l$

Oxygen	Nitrogen
= 16%	= 84%
= 1.28 l	= 6.72 l

Using by option A, total amount released = 2l

So, After first release, oxygen = 1.28 –16% of 2 litres

After second release, oxygen = 9.96 – 0.24 = 0.72 litres (which is 9% of 8 litres)

95. (B) Let CP of car = 100%

ATQ,

$(90\% + 5000)\times\frac{120}{100}=100000$

$108\% + 6000 = 100000$

$108\% = 94000$

$100\% = \frac{94000}{108}\times 100 = ₹\ 87000$

96. (B) Required sales = ₹ (1773 + 1115) = ₹ 2888 crore

97. (A)

98. (A)

99. (B) Required average = $\frac{8730+924}{2}$ = ₹ 4827 crores

100. (B) Required difference = ₹ (5345 – 1841) = ₹ 3504 crore

QUANTITATIVE ABILITY - 77 (ANSWER KEY)

1.	(C)	26.	(A)	51.	(B)	76.	(C)
2.	(A)	27.	(B)	52.	(C)	77.	(C)
3.	(A)	28.	(C)	53.	(B)	78.	(B)
4.	(C)	29.	(D)	54.	(D)	79.	(D)
5.	(D)	30.	(B)	55.	(B)	80.	(D)
6.	(B)	31.	(B)	56.	(A)	81.	(C)
7.	(A)	32.	(D)	57.	(D)	82.	(C)
8.	(A)	33.	(B)	58.	(B)	83.	(C)
9.	(A)	34.	(D)	59.	(A)	84.	(C)
10.	(A)	35.	(D)	60.	(B)	85.	(C)
11.	(A)	36.	(C)	61.	(A)	86.	(D)
12.	(A)	37.	(B)	62.	(A)	87.	(A)
13.	(A)	38.	(B)	63.	(D)	88.	(A)
14.	(D)	39.	(C)	64.	(A)	89.	(B)
15.	(A)	40.	(A)	65.	(A)	90.	(D)
16.	(C)	41.	(C)	66.	(D)	91.	(B)
17.	(B)	42.	(B)	67.	(B)	92.	(D)
18.	(A)	43.	(C)	68.	(C)	93.	(C)
19.	(B)	44.	(A)	69.	(B)	94.	(A)
20.	(B)	45.	(D)	70.	(C)	95.	(B)
21.	(C)	46.	(D)	71.	(D)	96.	(B)
22.	(D)	47.	(C)	72.	(D)	97.	(A)
23.	(B)	48.	(B)	73.	(A)	98.	(A)
24.	(B)	49.	(D)	74.	(A)	99.	(B)
25.	(C)	50.	(B)	75.	(A)	100.	(B)