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Solutions

S46. Ans.(d)

Sol. Let width of the path = x cm

So, length of the park will be = $(x + 4)$ cm

So,

$$\frac{4}{3} \times (\text{Area of path}) = \text{Area of the park}$$

$$\Rightarrow \frac{4}{3} [x(x + 4) - (x - 4)(x + 4 - 4)] = x(x + 4)$$

From this equation we can find out the value of x and hence all value can be find out.

S47. Ans.(d)

Sol. Let C invested for t days

A B C

$$1200 \times 12 : 2400 \times 4 : xt$$

And,

$$1200 \times 12 = xt$$

Here, x will depend on t and value of t can be maximum 8 month and minimum 1 months

On putting $t = 8$

$$x = 1800$$

Putting $t = 6$

$$x = 2400$$

on putting $t = 4$

$$x = 3600$$

on putting $t = 2$

$$x = 7200$$

S48. Ans. (e)

Sol. Let x men do the work in $(a - 6)$ days

And y women do the work in a days

So,

$$x(a - 6) = y(a)$$

From (i)

$$\text{Let } x = 5p$$

$$\text{And } y = 6p$$

$$5p(a - 6) = 6p(a)$$

$$5a - 30 = 6a$$

$$a = -30 \text{ not possible}$$

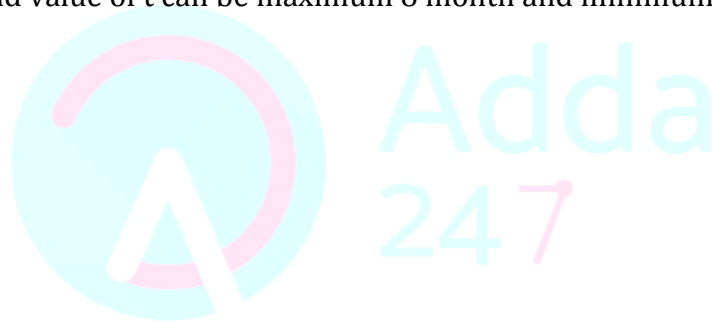
From (ii),

$$10p(a - 6) = 3p(a)$$

$$10a - 60 = 3a$$

$$7a = 60$$

$$a = \frac{60}{7} \text{ it is possible}$$



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From (iii)

$$8p(a - 6) = 5p(a)$$

$$8a - 48 = 5a$$

$$3a = 48$$

$$a = 16 \text{ possible}$$

From (iv)

$$10p(a - 6) = 7p(a)$$

$$10a - 60 = 7a$$

$$a = 20 \text{ possible}$$

So, (ii), (iii) and (iv) are possible

S49. Ans.(d)

Sol. Let total population of village A in 2000, 2008 and 2012 be $200x$, $300x$ and $400x$ respectively

So,

$$\frac{40}{100} \times 200x + \frac{50}{100} \times 300x + \frac{60}{100} \times 400x = 1410 \times 3$$

$$470x = 1410 \times 3$$

$$x = 9$$

$$\text{Required population} = 9 \times 200 = 1800$$

S50. Ans.(d)

Sol. Let population of village C in 2000, 2008 and 2012 be $(x + 2n)$, $(x + n)$ and x respectively

So,

$$\frac{50}{100}(x + n) = \frac{70}{100}(x)$$

$$5x + 5n = 7x$$

$$2x = 5n$$

$$n = \frac{2}{5}x$$

$$\text{Required percentage} = \frac{x+2n-x}{x+2n} \times 100$$

$$= \frac{2 \times \frac{2}{5}x}{\frac{9}{5}x} \times 100$$

$$= 44\frac{4}{9}\%$$

S51. Ans.(a)

Sol. Sum of literate from B in 2000 and 2008 = 1530

Sum of literate from B in 2008 and 2012 = 2010

And sum of literate from B in all years = 2490

So, literate in 2008 = $(1530 + 2010) - 2490 = 1050$

Let population of B in 2008 be x

So,

$$40\% \text{ of } x = 1050$$

$$x = 2625$$

S52. Ans.(e)**Sol.** From (i) & (ii),

Let, HCF be x

then LCM is 44x

$$44x + x = 540$$

$$x = \frac{540}{45} = 12$$

From (iii), $A + B = 10K$ Let, $A = 12a$ & $B = 12b$ Then $A + B = 12(a + b)$, where a & b are coprime.Also, $a \times b = 44$

Possible values of a and b are (4, 11) or (1, 44)

$$\text{Sum of } A + B = 12(4 + 11) = 180$$

$$\text{Or } A + B = 12(1 + 44) = 540$$

So, questioned can't be answered even after including all the statements.

S53. Ans.(d)**Sol.** Let A litres is removed and B litre of water is added to the mixture

Initially, Ratio of milk and water is 5 : 1.

ATQ,

$$200 - \frac{5}{6}A = 40 - \frac{A}{6} + B + 125$$

$$\Rightarrow 105 = 2A + 3B$$

Among the options only A, B and D satisfy this eqn.

S54. Ans.(b)**Sol.** Let number of red, green and blue ball be x, y and z respectively

ATQ,

$$x - y = y - z$$

$$y = \frac{x+z}{2} \text{ or } 2y = x + z$$

$$\text{And } \frac{z}{x+y+z} > 0.2$$

$$\frac{z}{3y} > \frac{1}{5}$$

$$5z > 3y$$

If $y = 5$, then $z > 3$ If $y = 10$, then $z > 6$, but this isn't possible

Hence,

Red	Green	Blue
6	5	4
4	5	6
3	5	7
2	5	8
1	5	9

5, 5, 5 isn't possible as number of balls is different

Hence, from given options only (b), (d) and (e) can be the answers.

So, option, Only (b), (d) and (e) is our correct answer.

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S55. Ans.(c)**Sol.** Let CP = 100 & MP = 160

From A

If profit = 60%

Hence no discount is possible here so, it is not satisfy equation

From B

When profit is 20% then discount will be $\frac{40}{160} \times 100 = 25\%$

When it doubles i.e. discount = 50%

Then, $SP = 160 - \frac{50}{100} \times 160 = 80$

So, it gave loss of 20% not possible

From C

When profit = 48%

Then discount = $\frac{12}{160} \times 100 = 7.5\%$

When it doubles = 15%

Then $SP = 160 - \frac{15}{100} \times 160 = 124$

So, profit is 24%

So, option C is possible

From D

When profit = 36%

Discount = $\frac{24}{160} \times 100 = 15\%$

When discount gets doubled = 30%

 $SP = 160 - \frac{30}{100} \times 160 = 112$

So profit is 12%, hence possible

From E

When profit = 44% = 10%

When discount = 20%

 $SP = 160 - \frac{20}{100} \times 160 = 128$

Profit is 28%

So, it is possible

Then C, D and E values are possible

S56. Ans.(d)**Sol.** Let first and fifth numbers be '2x' and '2a' respectively.Then, third number (A) = $\frac{2x+2a}{2} = x + a$ Second number = $\frac{2x}{2} = x$ 2x x x+a 62 2a

ATQ,

 $2x + x + x + a = 127$ $4x + a = 127$

From option (a) $x + a = 64$

$$\Rightarrow 3x = 63$$

$$\Rightarrow x = 21$$

$$\text{Average of five numbers} = \frac{42+21+64+62+2(64-21)}{5} = 55$$

According to this, option (d) 64, 55 is our correct answer.

S57. Ans.(b)

Sol. Let income of 'D' and 'E' is x and y respectively.

We have to find the value of 'x - y'.

From (I)

$$0.72x - 0.5y = 3200$$

From (II)

$$0.4x - 0.4y = 8000$$

$$\Rightarrow x - y = \frac{8000}{0.4} = 20000$$

Hence, only (II) is sufficient to answer the question.

S58. Ans.(e)

Sol. Let Rs C's income is Rs x

Atq,

$$\frac{0.44x + 0.52x}{2} = 19200$$

$$\Rightarrow x = \frac{2 \times 19200}{0.96} = 40,000$$

$$\text{A's income} = 1.2 \times 40,000 = 48,000$$

$$\text{A's expense in the month of November} = \frac{60}{100} \times 48000 = \text{Rs } 28800$$

S59. Ans.(d)

Sol. Let, income of B is Rs x

From (I)

$$0.6x - 0.4x = 16000$$

$$\Rightarrow x = \frac{16000}{0.2} = 80,000$$

$$\text{Amount invested by 'B' is PPF} = 80,000 \times \frac{40}{100} \times \frac{37.5}{100} = \text{Rs } 12,000$$

From (II)

$$0.6x - 0.4x = 16000$$

$$\Rightarrow x = \frac{16000}{0.2} = 80,000$$

$$\text{Amount invested by 'B' in PPF} = \frac{37.5}{100} \times \frac{40}{100} \times 80,000 = \text{Rs } 12000$$

Hence, Either statement (I) or statement (II) by itself is sufficient to answer the question.



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Solution (60-62):

Village	No. of wind mills	Maximum units produced	No. of houses	Wind mills operative			
				Week1	Week 2	Week 3	Week 4
A	24	2 lakh/week	540	75%	50%	75%	100%
B	20	80000 /week	240	50%	75%	100%	50%
C	15	1 lakh/week	150	40%	60%	80%	60%
D	12	1.5 lakh/week	350	75%	50%	50%	75%

S60. Ans.(b)

Sol. Number of mills operative in week 1 of village A = $\frac{75}{100} \times 24 = 18$

Level 1 (upper limit) of efficiency range 2 means 55%

Total units produced in village A in first week when operated at level 1 of efficiency range 2

$$= 18 \times \frac{55}{100} \times 2$$

Similarly,

Number of mills operative in village B in week 2

$$= \frac{75}{100} \times 20 = 15$$

level 2 (mid limit) of efficiency Range 1 = $\frac{60+70}{2}\%$

$$= 65\%$$

Total units produced in village B in week 2 when operated at level 2 of efficiency range 1

$$= 15 \times \frac{65}{100} \times .8$$

$$\text{Required ratio} = \frac{18 \times \frac{55}{100} \times 2}{15 \times \frac{65}{100} \times .8} = 33 : 13$$

S61. Ans.(b)

Sol. Mills operating in village C in week second and fourth is = $\frac{3}{5} \times 15$ and $\frac{3}{5} \times 15$ respectively.

Total units produced at level 1 of efficiency range 1

$$= (9 + 9) \times 100,000 \times \frac{70}{100}$$

$$= 18 \times 1000 \times 70 = 1260000$$

Mills operating in village A in first and fourth week is $24 \times \frac{3}{4}$ and 24 respectively

Total units produced at level 2 of efficiency range 1

$$= (18 + 24) \times 200000 \times \frac{65}{100}$$

$$= 42 \times 2000 \times 65 = 5,460,000 \text{ units}$$

$$\text{Required percentage} = \frac{126}{546} \times 100 = 23 \frac{21}{273} \%$$

S62. Ans.(e)

Sol. No. of mills operating in B in fourth week = $20 \times \frac{50}{100} = 10$

Total units consumed at level 3 of efficiency range 3 per house = $\frac{10 \times 80000 \times 30}{240 \times 100} = 1000 \text{ units/house}$

No. of mills operating in C in second week = $15 \times \frac{60}{100} = 9$

Total units consumed at level 1 of efficiency range 2 = $\frac{9 \times 1,00,000}{150} \times \frac{55}{100} = 3300 \text{ unit/house}$

Required ratio = 10 : 33

S63. Ans.(b)**Sol.**

Quantity I: $\frac{360}{120} \times 24 \cdot m^{7+2-4} \cdot n^{9-3+4} = 72 \cdot m^5 \cdot n^{10}$

If $m > 0$, $n < 0$, then Quantity I > 0

Quantity II: $\frac{240}{60 \times 3} x^{9-4+2} y^{7-3-3} = \frac{4}{3} x^7 y$

If $x < 0$, $y < 0$, then quantity II > 0

Quantity III: $\frac{48 \times 5}{6} a^{8+3-6} \cdot b^{(12-4-1)} = 40a^5b^7$

If $a > 0$, $b < 0$, then Quantity III < 0 .

∴ Relation between Quantity I and Quantity II can't be established but Quantity II $>$ Quantity III

∴ (#, @) is our correct answer.

Quantity I $>$ Quantity II = Quantity III

S64. Ans.(d)**Sol.**

Quantity I: $\frac{(p+n)^2 - (p-n)^2}{8pn(p+n)^2} = 1$

$\frac{p^2 + n^2 + 2pn - (p^2 + n^2 - 2pn)}{8pn(p+n)^2} = 1$

$\frac{4pn}{8pn(p+n)^2} = 1$

$\frac{1}{2} = (p+n)^2$

$p = \frac{1}{\sqrt{2}} - n$

Quantity II: $\frac{(q+n)^3 - (q-n)^3}{(n^2 + 3q^2)^2} = \frac{1}{8n}$

$\frac{q^3 + n^3 + 3q^2n + 3n^2q - (q^3 - n^3 - 3q^2n + 3n^2q)}{(n^2 + 3q^2)^2} = \frac{1}{8n}$

$\frac{2n^3 + 6q^2n}{(n^2 + 3q^2)^2} = \frac{1}{8n}$

$\frac{2n(n^2 + 3q^2)}{(n^2 + 3q^2)^2} = \frac{1}{8n}$

$16n^2 = n^2 + 3q^2$

$q = \sqrt{5}n$

Quantity III: $\frac{\sqrt{r+n} + \sqrt{r-n}}{\sqrt{r+n} - \sqrt{r-n}} = 2$

$\sqrt{r+n} + \sqrt{r-n} = 2(\sqrt{r+n} - \sqrt{r-n})$

$3\sqrt{r-n} = \sqrt{r+n}$

$9(r-n) = (r+n)$

$8r = 10n$

$r = \frac{10n}{8} = 1.25n$

Quantity I $<$ Quantity II $>$ Quantity III

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S65. Ans(c)**Sol.****Quantity I -**

Probability of at most two students will solve the question
 $= 1 - \text{probability of all three students will solve the question}$
 $= 1 - (0.5) \times (0.6) \times (0.3)$
 $= 1 - 0.09$
 $= 0.91$

Quantity II -

Total balls = 5 + 7 = 12

Probability of getting at least 1 green ball = 1 - probability of no green
 $= 1 - \frac{7}{44}$
 $= \frac{37}{44} \approx 0.84$

Quantity III -

$$P(\text{Arun speak truth}) = \frac{4}{5}$$

$$P(\text{Bhavya speak truth}) = \frac{6}{7}$$

Required probability

$$= \frac{4}{5} \times \frac{1}{7} + \frac{1}{5} \times \frac{6}{7}$$

$$= \frac{10}{35} = \frac{2}{7} \approx 0.28$$

Quantity I > Quantity II > Quantity III

S66. Ans.(e)**Sol.** ATQ,

$$S = \frac{D}{T} \quad \dots(i)$$

$$(S + 10) = \frac{D}{T-2} \quad \dots(ii)$$

$$(S - 15) = \frac{D}{T+6} \quad \dots(iii)$$

On solving (i), (ii) & (iii)

$D = 400 \text{ km}$, $S = 40 \text{ km/hr}$. $T = 10 \text{ hour}$

Statement 1, 2 and 4 can be found out from the given data but statement 3 can't be solved as length of tunnel is not given.

S67. Ans.(c)**Sol.** Let length of train A be $(x + 100) \text{ m}$

So, length of train B be $x \text{ m}$

$$(2x + 150) = (54 + 81) \times \frac{5}{18} \times 12 \text{ m}$$

$$= 135 \times 5 \times \frac{2}{3} \text{ m} = 450 \text{ m}$$

$$x = 150 \text{ m}$$



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Length of train A = 250 m

Length of train B = 150 m

(i) Cannot be obtained because speed of man is not given

(ii) Can be obtained

$$t = \frac{(250 + 175)}{81 \times \frac{5}{18}} = \frac{425}{81} \times \frac{81}{5}$$

$$\Rightarrow \frac{170}{9} \text{ sec}$$

(iii) it has already obtained

(iv) can't be obtained because no other condition regarding C has been given

Hence only (ii) and (iii) can be find out.

S68. Ans.(b)

Sol. Let the original number by xy

According to given condition

$$(10x + y) > 3(10y + x)$$

$$7x - 29y > 0$$

On putting y=1

X has to be more than or equal to 5

So for y = 1,

Possible values for x are 5, 6, 7, 8, 9

So, 5 numbers are possible when y is 1

(51), (61), (71), (81), (91) be

On putting y = 2

X has to be 9

So 92 is another number

Values greater than 2 are not possible for y.

If we take y = 3 than x has to be 13 which is not possible

So there are 6 possible numbers.

S69. Ans.(c)

Sol. $\frac{2R}{100} \times 10000 = 1400$

$$R = 7\%$$

Now for x = 1

R = 8% for CI

$$\text{Equivalent CI at rate of 8\% for 2 yrs} = 8 + 8 + \frac{64}{100} = 16.64\%$$

$$\text{CI at 8\% for 2 yr} = \frac{16.64}{100} \times 11400 = 16.64 \times 114 \text{ Rs}$$

$$\text{Approximately} = \frac{33}{2} \times 114 = 33 \times 57 = 1881$$

For 9%

$$\text{CI} = \frac{18.81}{100} \times 11400 = 18.80 \times 114$$

$$\text{Approx.} = 19 \times 114 = 2166$$

$$\text{For 10\%} = \frac{21}{100} \times 11400 = 21 \times 114 = 2394$$

So, 3 values of x are possible i.e, 1, 2 and 3.

S70. Ans.(b)

Sol. Let marked price of article A and B be $400x$ and $500x$ respectively
ATQ—

$$400x \times \frac{(100-d)}{100} = 500x \times \frac{(100-d-18)}{100}$$

$$400 - 4d = 410 - 5d$$

$$d = 10\%$$

$$\text{Cost price of article A} = \frac{400x \times \frac{90}{100}}{120} \times 100$$

$$= 300x \text{ Rs.}$$

$$\text{Cost price of article B} = \frac{500x \times \frac{(100-28)}{100}}{125} \times 100$$

$$= 288x \text{ Rs.}$$

ATQ—

$$\left(500x \times \frac{72}{100} - 288x\right) - \left(400x \times \frac{90}{100} - 300x\right) = 384$$

$$72x - 60x = 384$$

$$x = 32$$

$$\text{Cost price of article A} = 32 \times 300 = \text{Rs.9600}$$

$$\text{Cost price of article B} = 32 \times 288 = \text{Rs.9216}$$

S71. Ans.(b)

Sol. Efficiency of tap = 250 L/h

In November there are total 30 days.

Total flats = 20

Let tank is refilled n times

So,

$$n \times 600000 = 250 \times 24 \times 30 \times 20$$

$$n = 6 \text{ hours}$$

S72. Ans.(d)

Sol. Total time in which tank gets emptied

$$= \frac{25}{6} \times 24 = 100 \text{ hours}$$

$$\text{So, Rate of flow} = \frac{600000}{30 \times 100} = 200 \text{ L/hour}$$

$$A\% = \frac{250-200}{250} \times 100 = 20\%$$

S73. Ans.(d)

Sol. Let n number of flats were occupied

$$x \times 250 \times 100 = 600000$$

$$x = 24 \text{ flats}$$

$$B\% = \frac{24}{40} \times 100 = 60\%$$



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S78. Ans.(e)**Sol.**

	Days	Total work	efficiency
A	18	72	4 unit/daily
B	24		3 unit/daily
C	36		(-2) unit/daily

ATQ—

$$(A + B)x + (A + B - C) \left(\frac{5x + 24}{5} \right) = 72$$

$$7x + 5 \left(\frac{5x + 24}{5} \right) = 72$$

$$12x = 48 \Rightarrow x = 4$$

(A + B + C) work for

$$= 4 + 4 \frac{4}{5} = 8 \frac{4}{5} \text{ days}$$

S79. Ans.(c)

$$\text{Sol. Speed of current} = \frac{5}{9} \times \frac{18}{5} = 2 \text{ km/hr}$$

Let's still water speed = x km/hr

ATQ,

$$\frac{28 \times \frac{3}{4}}{(x-2)} - \frac{28}{(x+2)} = 3$$

$$21x + 42 - 28x + 56 = 3x^2 - 12$$

$$-7x + 98 = 3x^2 - 12$$

$$3x^2 + 7x - 110 = 0$$

$$x = 5 \text{ km/hr}$$

S80. Ans(e)

$$\text{Sol. Volume of cylindrical vessel} = \frac{22}{7} \times 17.5 \times 17.5 \times 18 = 17325 \text{ cm}^3$$

$$\text{Volume of milk} = 17325 \times \frac{80}{100} = 13860 \text{ cm}^3$$

$$30 \times 7 \times 3 \times h = 13860$$

$$h = \frac{462}{21} \Rightarrow h = 22 \text{ cm}$$

