Bipin Nambiar
(SBI PO 2018)

Shiraz Khan
(SBI Clerk 2018)

Kuldeep Yadav
(SBI PO 2018)

Rajat Saxena
(IBPS Clerk 2018)

Anupam Tyagi
(IBPS PO 2018)

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The Question Bank

Mixed Maths Questions for RBI Assistant Exams.

Set - 1

Direction: What should come in place of the Question mark (?) in the following question?

1.   26   52   208   1664   26624 ?

A. 851682   B. 851242   C. 851911
D. 851823   E. 851968

2.   15   8.5   10   ?   36.5   94.25

A. 16.5   B. 16   C. 15
D. 17   E. 20.25

3.   346   321   341   326   336 ?

A. 341   B. 350   C. 356
D. 330   E. 331

4.   26   17   33   8   44 ?

A. 5   B. – 4   C. – 3
D. – 5   E. None of these

5.   12705   1155   ?   33   11   5.5

A. 142   B. 165   C. 144
D. 198   E. None of these

6.   10   101   119   147   165 ?

A. 201   B. 205   C. 209
D. 215   E. None of these

7.   350   345   330   305   270 ?

A. 200   B. 210   C. 215
D. 225   E. 250

8.   15   21   24   30   33 ?

A. 90   B. 51   C. 39
D. 83   E. 54

9.   8   17   43   108   232 ?

A. 356   B. 444   C. 449
D. 554   E. None of these

10.   1   3   12   60   360 ?

A. 2525   B. 1520   C. 2025
D. 2052   E. None of these

11. $[(4)^3 \times (5)^4] \div (4)^5$ =?

A. 30.0925   B. 39.0625   C. 35.6015
D. 29.0825   E. None of these

12.   2/3 of 117 - 3/5 of 65 = ?

A. 40   B. 58   C. 52
D. 39   E. None of these

13. $?^2 + 200 \div \sqrt{64} - 6^2 \times 7 = 18 + \sqrt{121}$

A. 12   B. 25   C. 18
D. 16   E. None of these

14.   17.5% of 754 = $?^{1/2}$ + 51.31 + 51.64

A. 841   B. 324   C. 625
D. 900   E. 1225

15. $(569.72 + 113.68 - 183.4) \times \sqrt[3]{8} = ?^2 - 24$

A. 32   B. 35   C. 36
D. 40   E. None of these

16.   8765 − 3246 + 6783 = 4516 + ?

A. 6786   B. 7786   C. 7876
D. 8776   E. None of these

17. **70% of 1680 + ?% of 1750 = 55% of 2820 − 886**

A. 36   B. 34   C. 28
D. 38   E. None of these

18. **(? × 21% of 210) ÷ (17% of 170) = 3087 ÷ ?**

A. 15   B. 3√2   C. 15√5
D. 17√7   E. None of these

19. **185/37 × 96/4 + 1005/15 - 7/5 = ?**

A. 145.6   B. 248.8   C. 210.5
D. 185.6   E. None of these

20. **1/5 × 1/4 × 2000 = ? + 20**

A. 80   B. 100   C. 120
D. 50   E. 70

Directions (21-25): Study the following table chart carefully and answer the questions given beside.

In the table chart below sales data (in thousands) of different Electronic companies are given.

Years	LPB	VDCON	LILLIP	MONY
2016	250	500	500	750
2017	750	1000	750	1000
2018	1250	750	1250	1500
2019	1000	1250	1500	1750
2020	1250	1500	2000	2250

Questions:-

21. **Which company showed the largest percentage increase in sales from the year 2016 to 2020?**

A. VDCON   B. LILLIP   C. LPB
D. MONY   E. Can't be determined

22. **In the year 2020, the sales of VDCON gadgets were how much less than those of MONY?**

A. 16.67%   B. 33.33%   C. 20%
D. 50%   E. 40%

23. What was the average increase in the sales of LILLIP from 2016 to 2020? (in thousands)

A. 300   B. 75   C. 1500
D. 375   E. 350

24. In the year 2019, the sales of all the given companies accounted for 44% of total sales of electronic gadgets in India. The sales of MONY formed what percentage of total sales of electronic gadgets in India?

A. 616%   B. 15%   C. 13%
D. 17%   E. 14%

25. During which year were the sales of all the given companies the least when compared to the average sales for the given period?

A. 2019   B. 2018   C. 2016
D. 2020   E. 2017

Direction: What should come in place of the Question mark (?) in the following question?

Questions:

26. $(2\sqrt{392} - 35) + (\sqrt{8} - 7)^2 = ?^2$

A. − 4   B. 22   C. 13
D. 4   E. None of these

27. 94736 + 43693 + 25638 = ?

A. 160546   B. 164076   C. 165046
D. 160467   E. None of these

28. $3\frac{1}{4} + 7\frac{1}{6} - 5\frac{1}{8} = ? + 2\frac{1}{12}$

A. $3\frac{9}{48}$ B. $3\frac{5}{24}$ C. $2\frac{5}{24}$

D. $2\frac{5}{12}$ E. None of these

29. − 224 + (− 314) × (− 9) = ?

A. − 547   B. 2602   C. + 547
D. − 2602   E. None of these

30. $\sqrt{7 + \sqrt{64} + \sqrt{289}} = (?)^2 - 21$

A. 6   B. 5   C. 4
D. 8   E. 7

31. $7\frac{2}{7}$ of 189 + 452 = 2000 – ?

A. 183   B. 164   C. 170
D. 198   E. None of these

32. 80% of 2555 = 50% of 2518 + ?

A. 758   B. 857   C. 587
D. 785   E. None of these

33. $\dfrac{21}{25} \div \dfrac{9}{20} \times \dfrac{5}{12} \div \dfrac{10}{17} = ?$

A. 2.12   B. 5.42   C. 6.66
D. 1.32   E. None of these

34. $(11.1)^2 + (15.2)^2 - (12.3)^2 = ?$

A. 302.56   B. 202.96   C. 208.16
D. 212.96   E. None of these

35. $1\frac{13}{6} - 2\frac{7}{18} + 5\frac{4}{9} = ? + \frac{7}{3}$

A. $2\frac{3}{4}$ B. $5\frac{2}{3}$ C. $3\frac{8}{9}$

D. $1\frac{3}{4}$ E. None of these

36. A cartoonist has a target of making 50 cartoons in 3 days. He takes two hours to finish one cartoon. He took help of a person who takes 3 hours to finish one cartoon. If both started the work on 15 April at 12 pm then at what time the target gets completed?

A. 17 April 12 am   B. 18 April 12 pm   C. 19 April 2 am
D. 18 April 12 am   E. 17 April 12 pm

37. In the schools A, B, C and D, 48%, 34%, 56% and 58% is the percentage of students who passed in the respective schools. What is the total number of students who did not pass the exams in schools B and C, if 1100 students wrote the exams in each of the schools B and C?

A. 1205   B. 1210   C. 1130
D. 1115   E. None of these

38. Three taps T^1, T^2 and T^3 can fill one tank in 12, 20 and 24 hours respectively. If in the first hour T1 is opened, then in the next hour T2 and T3 are opened and same pattern continues then in how much time the tank will get full?

A. 12 hours   B. 11 hours 48 mins.   C. 13 hours
D. 11 hours 27.27 mins.   E. 12 hours 48 mins.

39. Sweeta is 10 years younger than her sister Seema who was 14 years old when her mother was 34 years old. The ratio of the ages of the mother and Sweeta after 6 years will be 2 : 1. After how many years the average of their ages will be 39.33 years?

A. 3 years   B. 2 years   C. 4 years
D. 1 years   E. 5 years

40. Sachin started a business with Sumit with an investment $1/3^{rd}$ times the investment of Sumit. After $1/4^{th}$ of the time in business, Sumit left. If the business was for 2 years and Sachin received a profit of Rs. 13440. How much was the total profit?

A. Rs. 24520   B. Rs. 25440   C. Rs. 23520
D. Rs. 32420   E. Rs. 22520

41. The ratio of savings of Rocky and Monty is 3 : 5. Rocky lent his sum at 20% p.a simple interest for two years and Monty lent his sum at 10% p.a compound interest for two years. After 2 years, what will be the ratio of the amount received by them?

A. 84/217   B. 21/221   C. 84/121
D. 63/121   E. 221/21

42. The average age of a group of 30 friends is 34 years. The average age of the first 10 friends is 31 years and the average age of the last 18 friends is 33 years. What will be the average age of the 11th and 12th friend?

A. 52 years   B. 54 years   C. 56 years
D. 50 years   E. 58 years

43. A man purchased 5 T-shirts from a garment shop at Rs. 450 each. When he reached home, he found that two T-shirts were defective. One of the T-shirt is having a small hole and other have colour misprint. He goes for the return of the 2 pieces, but the shopkeeper gives him discount of 5% and 10% on those T-shirts and the man agrees with the same. How much money is refunded by the shopkeeper?

A. Rs. 70   B. Rs. 67.5   C. Rs. 75

D. Rs. 76.5   E. Rs. 78

44. When the trains run in opposite direction, the relative speed is double the relative speed when the trains run in the same direction. The length of the trains is 300 m and 320 m respectively. Find the time taken by the trains to cross each other when in opposite direction, if they take 20 seconds to cross when in the same direction?

A. 8 sec   B. 6 sec   C. 7 sec

D. 9 sec   E. 10 sec

45. The escalator moves at a constant speed. Rani and Sonia walk up the escalator(moving stairway). Rani takes 4 steps for every 9 steps of Sonia. Rani gets to the top after taking 20 steps while Soina, because of her faster pace, ends up taking 30 steps to reach the top.

If the escalator were turned off, how many steps would they have to take to walk up?

A. 70   B. 60   C. 80

D. 90   E. 50

Correct Answers:

1	2	3	4	5	6	7	8	9	10
E	D	E	D	B	A	D	C	C	E
11	12	13	14	15	16	17	18	19	20
B	D	D	A	A	B	E	D	D	A
21	22	23	24	25	26	27	28	29	30
C	B	D	E	C	E	E	B	B	B
31	32	33	34	35	36	37	38	39	40
E	D	D	B	C	D	B	D	B	C
41	42	43	44	45					
C	E	B	E	E					

Explanations:

1.

Series Pattern	Given Series
26	26
26 × 2	52
52 × 4	208
208 × 8	1664
1664 × 16	26624
26624 × 32	851968 ✓

Hencce, option E is correct.

2.

Series Pattern	Given Series
15	15
15 × 0.5 + 1	8.5
8.5 × 1 + 1.5	10
10 × 1.5 + 2	17 ✓
17 × 2 + 2.5	36.5
36.5 × 2.5 + 3	94.25

Hence, option D is correct

3.

Series Pattern	Given Series
346	346
346 – 25	321
321 + 20	341
341 – 15	326
326 + 10	336
336 – 5	331 ✓

Hence, option E is correct.

4.

Series Pattern	Given Series
26	26
26 − 3²	17
17 + 4² = 33	33
33 − 5² = 8	8
8 + 6² = 44	44
44 − 7² = − 5	− 5 ✓

Hence, option (D) is correct.

5.

Series Pattern	Given Series
12705	12705
12705 ÷ 11	1155
1155 ÷ 7	165 ✓
165 ÷ 5	33
33 ÷ 3	11
11 ÷ 2	5.5

Hence, option (B) is correct.

6.

Series Pattern	Given Series
10	10
(10² + 1)	101
(11² − 2)	119
(12² + 3)	147
(13² − 4)	165
(14² + 5)	201 ✓

Hence, option A is correct.

7.

Series Pattern	Given Series
350	350
350 – 5	345
345 – 15	330
330 – 25	305
305 – 35	270
270 – 45	225 ✓

Hence, option D is correct.

8.

Series Pattern	Given Series
15	15
15 + (1 + 5)	21
21 + (2 + 1)	24
24 + (2 + 4)	30
30 + (3 + 0)	33
33 + (3 + 3)	39 ✓

Hence, option C is correct.

9.

Series Pattern	Given Series
8	8
8 + 23 + 1	17
17 + 33 – 1	43
43 + 43 + 1	108
108 + 53 – 1	232
232 + 63 + 1	449 ✓

Hence, option C is correct.

10.

Series Pattern	Given Series
1	1
1 × 3	3
3 × 4	12
12 × 5	60
60 × 6	360
360 × 7	2520 ✓

Hence, option E is correct.

11.

$[(4)^3 × (5)^4] ÷ (4)^5 = ?$

$? = \dfrac{4^3 × 5^4}{4^5} = \dfrac{5^4}{4^2} = \dfrac{625}{16} = 39.0625$

Hence, option B is correct.

12.

$? = \dfrac{2}{3}$ of $117 - \dfrac{3}{5}$ of 65

$= 2 × 39 - 3 × 13$

$= 78 - 39 = 39$

Hence, option D is correct.

13.

$?^2 + 200 ÷ 64 - 6^2 ×7 = 18 + 121$

$?^2 + 200 ÷ 8 - 36 × 7 = 18 + 11$

$?^2 + 25 - 252 = 29$

$?^2 = 29 - 25 + 252$

$?^2 = 4 + 252$

$?^2 = 256$

$? = 16$

Hence, option D is correct.

14.

17.5% of 754 = $?^{1/2}$ + 51.31 + 51.64

35% of 377 = $?^{1/2}$ + 102.95

131.95 − 102.95 = $?^{1/2}$

$?^{1/2}$ = 29

? = 841

Hence, option A is correct.

15.

(569.72 + 113.68 − 183.4) × 8 = $?^2$ − 24

(683.4 − 183.4) × 2 = $?^2$ − 24

500 × 2 + 24 = $?^2$

$?^2$ = 1000 + 24

$?^2$ = 1024

? = 32

Hence, option A is correct.

16.

8765 − 3246 + 6783 = 4516 + ?

? = 8765 − 3246 + 6783 - 4516

? = 7786

Hence, option B is correct.

17.

70% of 1680 + ?% of 1750 = 55% of 2820 − 886

or, 70% of 1680 + $\dfrac{?}{100}$ of 1750 = 55% of 2820 − 886

or, $\dfrac{70}{100}$ × 1680 + $\dfrac{?}{100}$ × 1750 = $\dfrac{55}{100}$ × 2820 − 886

or, 1176 + 17.5 × ? = 1551 − 886

or, 17.5 × ? = 1551 − 886 − 1176

∴ ? = $\dfrac{-511}{17.5}$ = − 29.2

Hence, option E is correct.

18.

(? × 21% of 210) ÷ (17% of 170) = 3087 ÷ ?

(? × 441 ÷ 289) = 3087 ÷ ?

$?^2$ = 3087 × 289 ÷ 441

$?^2$ = 289 × 7

? = 17 $\sqrt{7}$

Hence, option D is correct.

19.

$\dfrac{185}{37}$ × $\dfrac{96}{4}$ + $\dfrac{1005}{15}$ − $\dfrac{7}{5}$ = ?

⇒ 5 × 24 + 67 − 1.4 = ?

⇒ 120 + 67 − 1.4 = ?

⇒ 185.6 = ?

Hence, option D is correct.
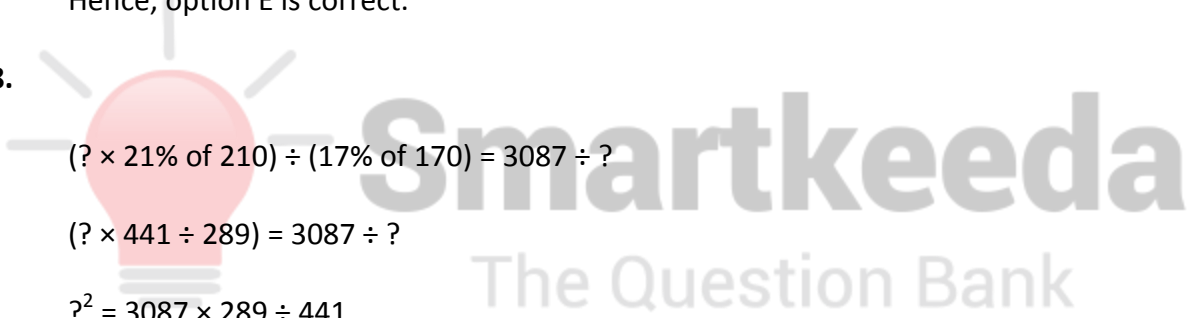
20.

$$\frac{1}{5} \times \frac{1}{4} \times 2000 = ? + 20$$

$\Rightarrow 100 - 20 = ?$

$\Rightarrow 80 = ?$

Hence, option A is correct.

21.

If we observe carefully, we can say that the sales of LPB in 2020 is five times that of the year 2016, (i.e., 400% increase) but in the case of other companies sales in 2020 is less than five times that of 2016.

Hence, option C is correct.

22.

Sales of VDCON in 2020 were 1500 thousand. Sales of MONY in 2020 were 2250 thousand. We can say that the sales of VDCON are less than MONY. We need to calculate the percentage by which the sales of VDCON are less than those of MONY. i.e., here we need to calculate with respect to MONY.

The required percentage is,

$$\rightarrow 100 \times \left(\frac{2250 - 1500}{2250}\right) = \frac{750 \times 100}{2250} = 33.33\%$$

Hence, option B is correct.

23.

The total increase in the sales of LILLIP from 2016 to 2020 is 1500 thousands.

To find the average increase, we need to divide the total increase by the total number of intervals.

i.e. , $\dfrac{1500}{4}$ = 375 thousands.

Hence, option D is correct.

24.

We know that companies mentioned here (in the line graph) will not represent the total sales of electronic goods in India. There may be other companies also and it is given that the companies given here accounted for 44% of the total sales in India in 2019 is represented by 1750 + 1500 + 1250 + 1000 = 5500

i.e., 44% is represented by 5500

We need to find the share of MONY i.e., 1750

Share of MONY = $\dfrac{1750 \times 44}{5500}$ = 14%

Hence, option E is correct.

25.

By simple observation, we can say that all the given companies have their least sales(among the given years) in 2016. The total sales also should be the least in the Same year.

Hence, option C is correct.

26.

$(2\sqrt{392} - 35) + (\sqrt{8} - 7)^2 = ?^2$

or, $?^2 = \sqrt{2\sqrt{49 \times 8} - 35 + 8 + 49 - 14\sqrt{8}}$

or, $?^2 = 14\sqrt{8} - 35 + 8 + 49 - 14\sqrt{8}$

$? = \sqrt{22}$

Hence, option E is correct.

27.

94736 + 43693 + 25638 = 164067

Hence, option E is correct.

28.

$$3\frac{1}{4} + 7\frac{1}{6} - 5\frac{1}{8} = ? + 2\frac{1}{12}$$

$$? = (3 + 7 - 5 - 2) + (\frac{1}{4} + \frac{1}{6} - \frac{1}{8} - \frac{1}{12})$$

$$= 3 + (\frac{6 + 4 - 3 - 2}{24}) = 3 + \frac{5}{24} = 3\frac{5}{24}$$

Hence, option B is correct.

29.

− 224 + (− 314) × (− 9) = − 224 + 2826 = 2602

Hence, option B is correct.

30.

$$\sqrt{7 + \sqrt{64} + \sqrt{289}} = (?)^2 - 21$$

$$Or, (?)^2 = \sqrt{7 + \sqrt{64} + 17 + 21}$$

$$Or, (?)^2 = \sqrt{7 + \sqrt{81} + 21}$$

$$Or, (?)^2 = \sqrt{7} + 9 + 21$$

$$Or, (?)^2 = \sqrt{16} + 21$$

Or, $?^2$ = 4 + 21

Or, ? = √25 = 5

Hence, option B is correct.

31.
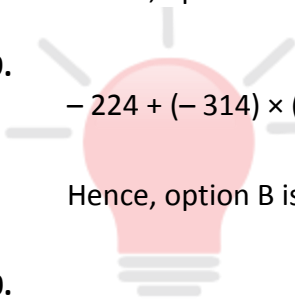
$$7\frac{2}{7} \text{ of } 189 + 452 = 2000 - ?$$

$$= \frac{51}{7} \text{ of } 189 + 452 = 2000 - ?$$

or, ? = 2000 − (1377 + 452)

∴ ? = 2000 − 1829 = 171.

Hence, option E is correct.

32.

80% of 2555 = 50% of 2518 + ?

⇒ 2044 − 1259 = ?

⇒ ? = 785

Hence, option D is correct.

33. $? = \frac{21}{25} \div \frac{9}{20} \times \frac{5}{12} \div \frac{10}{17}$

$$= \frac{21}{25} \times \frac{20}{9} \times \frac{5}{12} \times \frac{17}{10}$$

$$= \frac{119}{90} = 1.32$$

Hence, option D is correct.

34. $(11.1)^2 + (15.2)^2 - (12.3)^2 = ?$

$? = (11.1)^2 + (15.2)^2 - (12.3)^2$

? = 123.21 + 231.04 − 151.29

? = 202.96

Hence, option B is correct.

35.

$$1\frac{13}{6} - 2\frac{7}{18} + 5\frac{4}{9} = ? + \frac{7}{3}$$

$$1\frac{13}{6} - 2\frac{7}{18} + 5\frac{4}{9} - \frac{7}{3} = ?$$

$$1 - 2 + 5 + (\frac{13}{6} - \frac{7}{18} + \frac{4}{9} - \frac{7}{3}) = ?$$

$$6 - 2 + (\frac{39 - 7 + 8 - 42}{18}) = ?$$

$$4 + (\frac{-2}{18}) = ?$$

$$3 + (1 - \frac{1}{9}) = ?$$

$$? = 3 + \frac{8}{9}$$

$$? = 3\frac{8}{9}$$

Hence, option C is correct.

36.

Smart Approach:-

Take LCM{2, 3} = 6

In 6 hours, cartoonist can make = $\frac{6}{2}$ = 3 cartoons

In 6 hours, helper can make = $\frac{6}{3}$ = 2 cartoons

In 6 hours, both can make = 5 cartoons

For making 50 cartoons they need 10 such periods.

So, total time taken by both to make 50 cartoons = 10 × 6 = 60 hours.

The target gets completed by 18 April 12 am.

Hence, option D is correct.

Traditional Method:-

The cartoonist takes 2 hours/cartoon and the helper takes 3 hours/cartoon.

Cartoons made by Cartoonist in 1 day = $\dfrac{24}{2}$ = 12 cartoons

Cartoons made by helper in 1 day = $\dfrac{24}{3}$ = 8 cartoons

Cartoons made by Cartoonist in 2 days = 24 cartoons

Cartoons made by helper in 2 days = 16 cartoons

Total cartoons made in 2 days = 24 + 16 = 40 cartoons

Remaining cartoons = 50 − 40 = 10

In the next 12 hours, Cartoonist makes

= $\dfrac{12}{2}$ = 6 cartoons and helper makes = $\dfrac{12}{3}$ = 4 cartoons

So the target is completed in = 48 + 12 = 60 hours

The target gets completed by 18 April 12 am.

37.

Number of students who did not pass in school B

= $\dfrac{1100 \times 66}{100}$ = 726

Number of students who did not pass in school C
= $\dfrac{1100 \times 44}{100}$ = 484

Total number of students who did not pass in schools B and C = 726 + 484 = 1210

Hence, option B is correct.

38.

Capacity of one tank is = LCM{12, 20, 24} = 120 units

In 1 hour, capacity of water that T_1 can fill

$= \dfrac{120}{12} = 10$ units

In 1 hour, capacity of water that T_2 can fill

$= \dfrac{120}{20} = 6$ units

In 1 hour, capacity of water that T_3 can fill

$= \dfrac{120}{24} = 5$ units

In the first hour T_1 is open, in the second hour, T_2 and T_3 are opened.

So, in the set of two hours = $T_1 + (T_2 + T_3)$

$\rightarrow 10 + (6 + 5) = 21$ units

In 10 hours, capacity that gets filled = 21 × 5 = 105 units

Remaining capacity = 120 − 105 = 15 units

In the next hour, it's T1's turn, it fills 10 units/hr. So,

$\rightarrow 15 - 10 = 5$ units

Now, it's $T_2 + T_3$ turn, it fills 11 units/hr. So, 5 units will be filled in

$= \dfrac{5 \times 60}{11} = 27.27$ mins

Total time to fill the tank = 10 + 1 + 27.27 mins = 11 hours 27.27 mins

Hence, option D is correct.

39.

Let the present age of Seema be x years

Sweeta's present age = x – 10

When Seema was 14 years, mother was 34 years. So, when Seema is x years, mother will

be = 34 – 14 + x

Mother's present age = 20 + x

According to the question,

$$\frac{x + 20 + 6}{x - 10 + 6} = \frac{2}{1}$$

$$\frac{x + 26}{x - 4} = \frac{2}{1}$$

x = 34 years

Seema's age = 34 years

Sweeta's age = 24 years

Mother's present age = 54 years

Average = $\frac{34 + 24 + 54}{3}$ = 37.33 years

After 2 years, Seema's age = 36 years, Sweeta's age = 26 years, Mother's age = 56 years
Average after 2 years,

Avg = $\frac{36 + 26 + 56}{3}$ = 39.33 years

Hence, option B is correct.

40.

Let the investment of Sumit = Rs. x

Investment of Sachin = Rs. $\dfrac{x}{3}$

Time for which Sumit invested = $\dfrac{2}{4} = \dfrac{1}{2}$ year

Time for which Sachin invested = 2 years

Profit ratio, Sachin : Sumit = $(\dfrac{x}{3})(2) : (x)(\dfrac{1}{2})$

Profit ratio = 4 : 3

Share of Sachin = total profit $\times \dfrac{4}{7}$

Let total Profit be P

$\dfrac{7 \times 13440}{4} = P$

P = Rs. 23520

Hence, option C is correct.

41.

Let the saving of Rocky and Monty be 3x and 5x respectively.

Amount received by Rocky = $\dfrac{3x \times 140}{100} = \dfrac{21x}{5}$

Amount received by Monty

$= 5x \left(1 + \dfrac{10}{100}\right)^{2} = 5x \left(\dfrac{121}{100}\right)$

Ratio of the amount received by Rocky and Monty

$= \dfrac{21x/5}{5x(121/100)}$

Reqd. ratio = $\dfrac{\dfrac{21}{5}}{\dfrac{5 \times 121}{100}} = \dfrac{84}{121}$

Hence, option C is corrrect.

42.
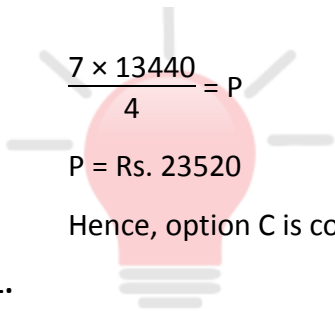
The average age of 30 friends = 34 years

Sum of the ages of 30 friends = 34 × 30 = 1020 years

The average age of the first 10 friends = 31 years

Sum of the ages of the first 10 friends = 31 × 10 = 310 years

The average age of the last 18 friends = 33 years

Sum of the ages of the last 18 friends = 33 × 18 = 594 years

Now the sum of the ages of the 11th and 12th friend = (1020 – 310 – 594) = 116

Average of the age of 11th and 12th friend

$= \dfrac{116}{2}$ = 58 years

Hence, option E is correct.

43.

Smart Approach:-

He got discount of 5% and 10% on the same amount of Rs. 450 .

So total discount = 15% of 450 = Rs. 67.5

Hence, option B is correct

Traditional Method:

Total price of the 2 T-shirts = 2 × 450 = Rs. 900

Price of the first T-shirt after 5% discount

$= 450 - 5 \times \dfrac{450}{100} = 450 - 22.5 = $ Rs. 427.5

Price of the second T-shirt after 10% discount

$= 450 - 10 \times \dfrac{450}{100} = 450 - 45 = $ Rs. 405

Amount refunded by the shopkeeper = Rs. (22.5 + 45) = Rs. 67.5

Hence, option B is correct.

44.

Smart Approach:-

When the trains run in opposite direction, the relative speed is double the relative speed when the trains run in the same direction.

They take 20 seconds to cross when in the same direction , so the time taken to cross when in opposite direction will be half of the time taken when in the same direction which will be equal to 20/2 = 10 secs

Hence option E is correct.

Traditional Method:

Let the speeds of the trains be p and q m/sec. The relative speed when trains are in the opposite direction be x m/sec.

Total distance covered = 300 + 320 = 620m

When they run in the same direction, relative speed (p – q) is given by

$$p - q = \frac{620}{20} = 31 \text{ ....(i)}$$

When they run in the opposite direction, relative speed (p + q) is given by

$$p + q = \frac{620}{x} \text{ ....(ii)}$$

Given that,

p + q = 2 × 31 = 62 m/sec

by putting values in (2), we get

$$x = \frac{620}{62} = 10 \text{ sec}$$

Time taken by the trains to cross each other when in opposite direction is 10 seconds. Hence, option E is correct.

45.

The ratio of speed of Rani and that of Sonia is 4 : 9

When the escalator is turned off, let the number of steps visible be x.

Given that, Rani takes 20 steps to reach the top and Sonia takes 30 steps to reach the top. The ratio of speed of Rani to that of escalator

$$= \frac{20}{x - 20} \quad \ldots\ldots\ldots(i)$$

The ratio of speed of Sonia to that of escalator

$$= \frac{30}{x - 30} \quad \ldots\ldots\ldots(ii)$$

(i)/(ii)

The ratio of speed of Rani to that of Sonia

$$\rightarrow \frac{\dfrac{20}{x - 20}}{\dfrac{30}{x - 30}} = \frac{4}{9}$$

$$\rightarrow \frac{20\,(x - 30)}{30\,(x - 20)} = \frac{4}{9}$$

$$\rightarrow 3x - 90 = 2x - 40$$

$$\rightarrow x = 50$$

Hence, option E is correct.