Quantitative Aptitude Test for KMAT

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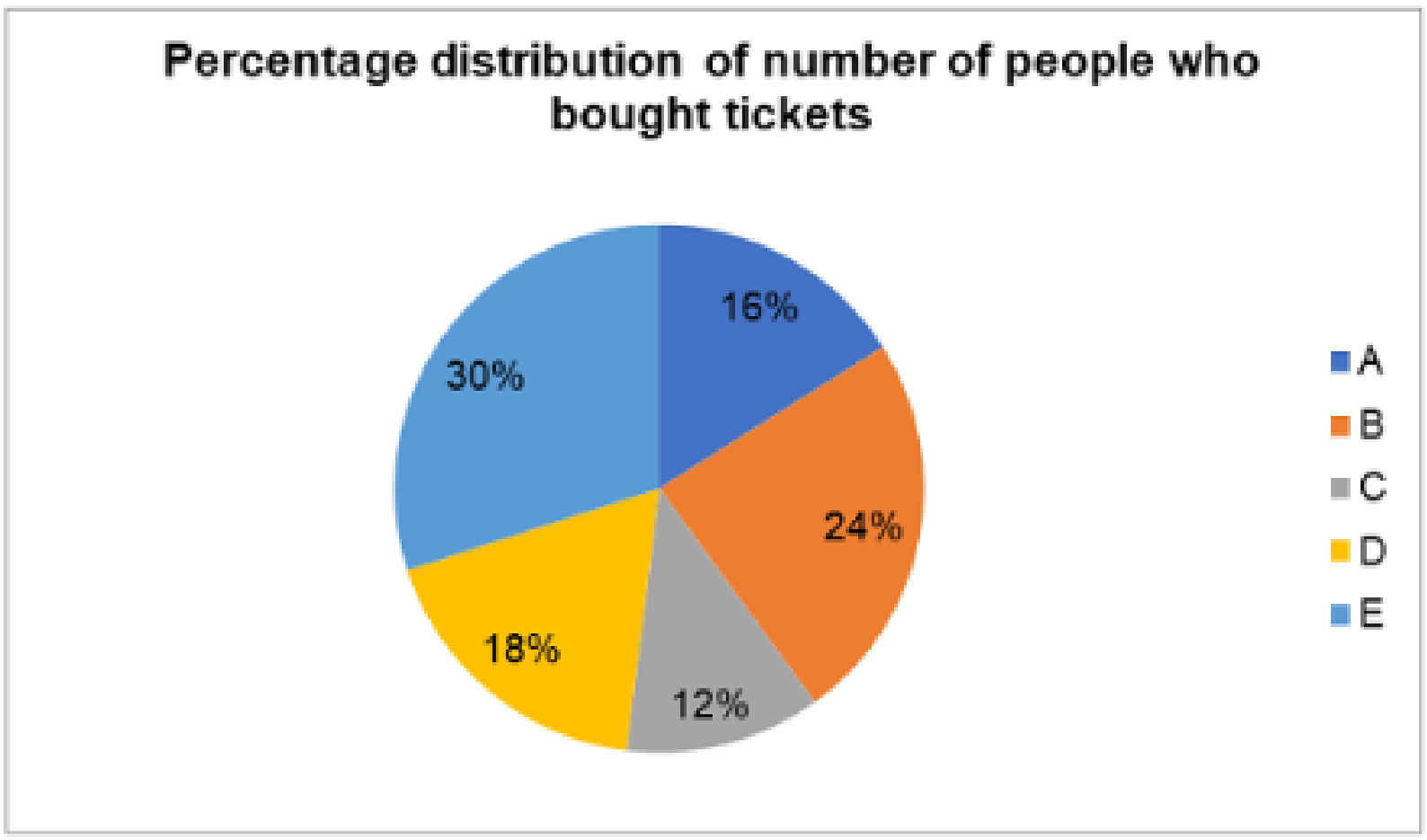
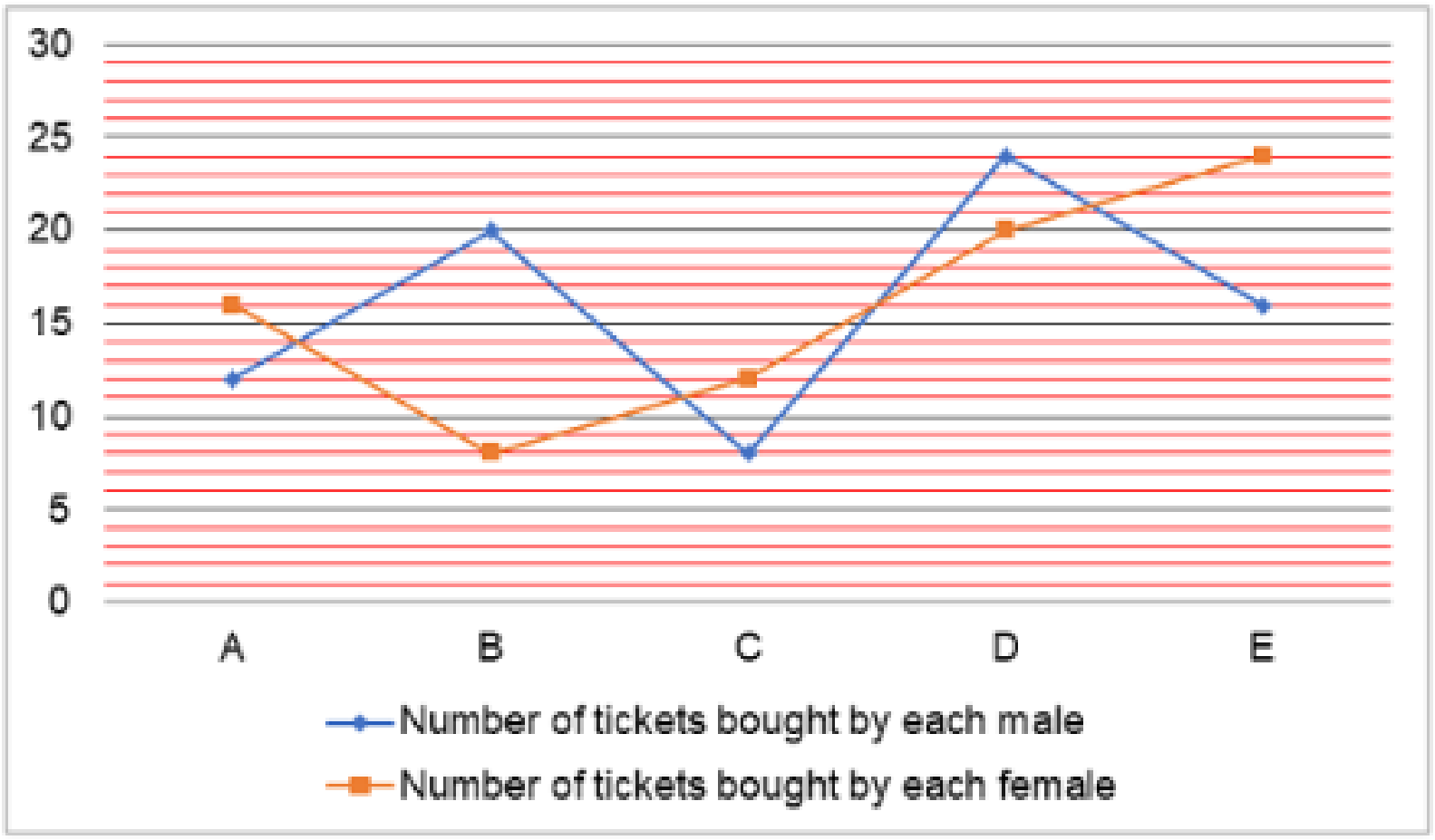
1. **Directions: Answer the questions based on the information given below.**

   7500 people from five different cities (A, B, C, D and E) bought some tickets for a concert. The given pie-chart shows the percentage distribution of number of people who bought tickets from given five different cities.



   Note: Each male and each female has to pay 12% and 5% tax, respectively on each ticket bought.

   The given line graph shows the number of tickets bought by each male and each female from given five cities.



A. **Find the average of number of people who bought tickets from cities 'A', 'C' and 'D'.**

A 1050

B 1150

C 1320

D 960

Solution

According to question,

	Number of people who bought tickets	Number of tickets bought by each male	Number of tickets bought by each female
A	$0.16 \times 7500 = 1200$	12	16
B	$0.24 \times 7500 = 1800$	20	8
C	$0.12 \times 7500 = 900$	8	12
D	$0.18 \times 7500 = 1350$	24	20
E	$0.30 \times 7500 = 2250$	16	24

Required average = $(1200 + 900 + 1350) \div 3 = 1150$

Hence, option B.

B. **If out of total people who bought tickets from each of the cities 'C' and 'D', 350 were females, then find the total amount (in Rs.) paid by males who bought tickets from given two cities if price of each ticket for males from cities 'C' and 'D' is Rs. 40 and Rs. 15, respectively.**

A 600160

B 585110

C 624500

D **None of these**

Solution

According to question,

	Number of people who bought tickets	Number of tickets bought by each male	Number of tickets bought by each female
A	$0.16 \times 7500 = 1200$	12	16
B	$0.24 \times 7500 = 1800$	20	8
C	$0.12 \times 7500 = 900$	8	12
D	$0.18 \times 7500 = 1350$	24	20
E	$0.30 \times 7500 = 2250$	16	24

Number of males who bought tickets from city ‘C’ = 900 – 350 = 550

Total number of tickets bought by males from city ‘C’ = 550 × 8 = 4400

Therefore, total amount paid by males from city ‘C’ = 1.12 × 40 × 4400 = Rs. 197120

Number of males who bought tickets from city ‘D’ = 1350 – 350 = 1000

Total number of tickets bought by males from city ‘D’ = 1000 × 24 = 24000

Therefore, total amount paid by males from city ‘D’ = 24000 × 1.12 × 15 = Rs. 403200

Required amount = 403200 + 197120 = Rs. 600320

Hence, option D.

C. **Out of total people who bought tickets from each of the cities ‘B’ and ‘C’, 450 were males. Find the ratio of the number of tickets bought by females from cities ‘B’ and ‘C’, respectively.**

A **2:1**

B 3:1

C 4:3

D 3:2

Solution

According to question,

	Number of people who bought tickets	Number of tickets bought by each male	Number of tickets bought by each female
A	$0.16 \times 7500 = 1200$	12	16
B	$0.24 \times 7500 = 1800$	20	8
C	$0.12 \times 7500 = 900$	8	12
D	$0.18 \times 7500 = 1350$	24	20
E	$0.30 \times 7500 = 2250$	16	24

Number of females who bought tickets from city ‘B’ = 1800 – 450 = 1350

Number of female who bought tickets from city ‘C’ = 900 – 450 = 450

Required ratio = (1350 × 8):(450 × 12) = 2:1

Hence, option A.

D. **If in city ‘A’ 50% were males and in city ‘E’ 40% were females, then the number of tickets bought by females from city ‘E’ is how much percent more/less than the number of tickets bought by females from city ‘A’.**

A 80%

B 75%

C **125%**

D 150%

Solution

According to question,

	Number of people who bought tickets	Number of tickets bought by each male	Number of tickets bought by each female
A	$0.16 \times 7500 = 1200$	12	16
B	$0.24 \times 7500 = 1800$	20	8
C	$0.12 \times 7500 = 900$	8	12
D	$0.18 \times 7500 = 1350$	24	20
E	$0.30 \times 7500 = 2250$	16	24

Number of tickets bought by females from city 'A' = $0.5 \times 1200 \times 16 = 9600$

Number of tickets bought by females from city 'E' = $0.4 \times 2250 \times 24 = 21600$

Required percentage = $\{(21600 - 9600)) \div 9600\} \times 100 = 125\%$

Hence, option C.

E. **The ratio of the number of males and females who bought tickets from city 'A' is 7:8, respectively. If the price of each ticket for male and female is Rs. 25 and Rs. 12, respectively, then find the difference between amounts (in Rs.) paid by 25% of males and 50% of females, who bought tickets from city 'A'.**

A 14242

B 18342

C **17472**

D 12654

Solution

According to question,

	Number of people who bought tickets	Number of tickets bought by each male	Number of tickets bought by each female
A	0.16 × 7500 = 1200	12	16
B	0.24 × 7500 = 1800	20	8
C	0.12 × 7500 = 900	8	12
D	0.18 × 7500 = 1350	24	20
E	0.30 × 7500 = 2250	16	24

Number of males who bought tickets from city 'A' = $1200 \times \frac{7}{15} = 560$

Number of females who bought tickets from city 'A' = 1200 – 560 = 640

Number of tickets bought by 25% of males = 0.25 × 560 × 12 = 1680

Therefore, amount paid by 25% of males = 1.12 × 25 × 1680 = Rs. 47040

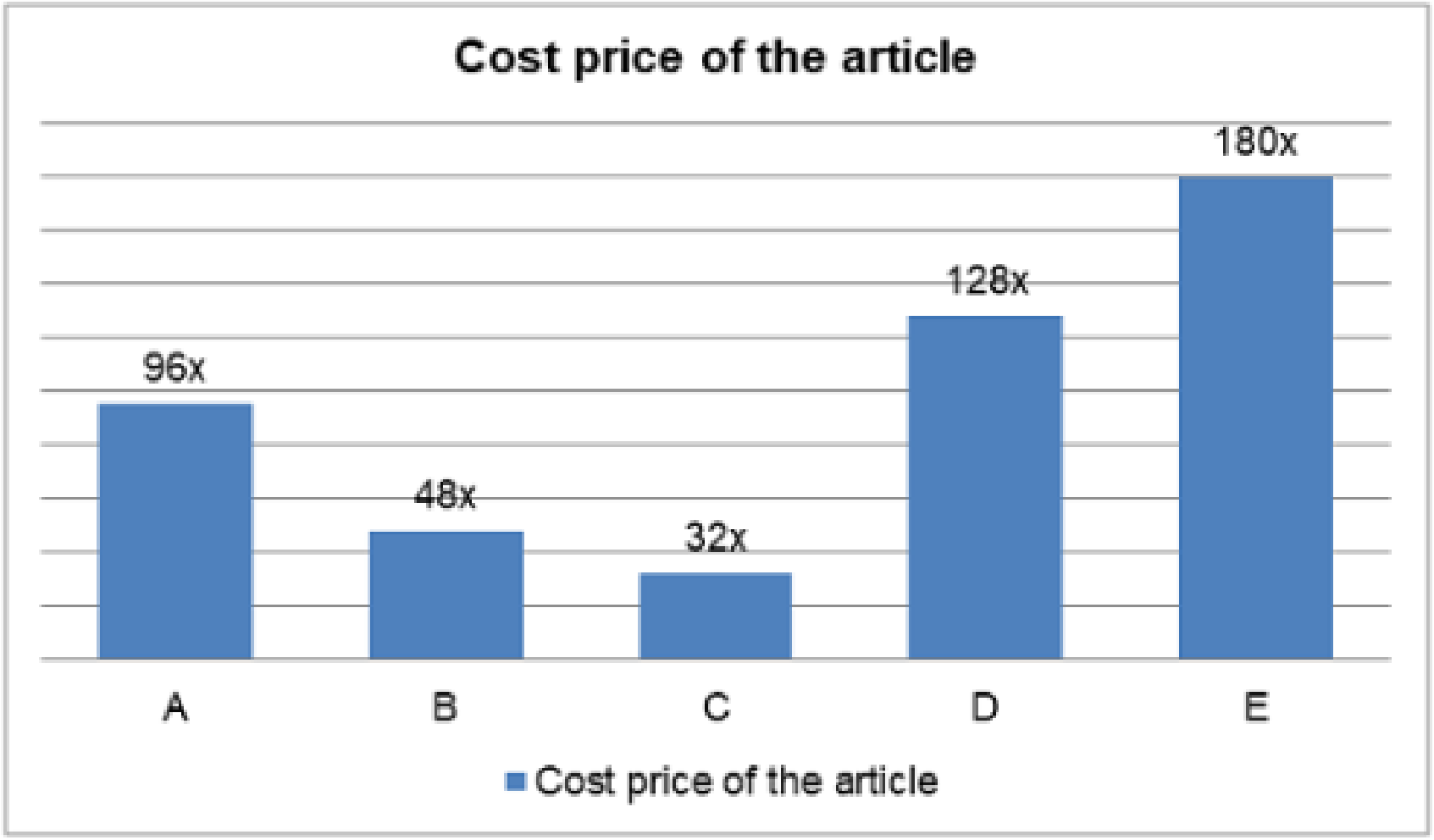
Similarly, amount paid by 50% of females = 1.05 × 12 × 320 × 16 = Rs. 64512

Required difference = 64512 – 47040 = Rs. 17472

Hence, option C.

2. **Directions: Answer the questions based on the information given below.**

The given bar graph shows the cost price of five different articles. If the cost price is less than Rs. 1500, then it is marked up by 20% and if the cost price is more than Rs. 1500 then it is marked up by 25%. If the marked price of the item is less than Rs. 3500, then the discount offered is 15% and if the marked price is more than Rs. 3500 then the discount offered is 20%. The sum of the cost price of all the articles is Rs. 12100.



A. **If the article 'E' had been sold at a loss of 20%, then find the discount percentage offered on it, given the article is marked up above its cost price by the same percentage.**

A 52%

B 24%

C **36%**

D 42%

Solution

According to the question,

96x + 48x + 32x + 128x + 180x = 12100

Or, 484x = 12100

Or, x = 12100 ÷ 484 = Rs. 25

	Cost price of the article (in Rs.)	Marked price of the article (in Rs.)	Discount offered on the article (in Rs.)	Selling price of the article (in Rs.)
A	96x = 2400	1.25 × 2400 = 3000	0.15 × 3000 = 450	3000 - 450 = 2550
B	48x = 1200	1.2 × 1200 = 1440	0.15 × 1440 = 216	1440 - 216 = 1224
C	32x = 800	1.2 × 800 = 960	0.15 × 960 = 144	960 - 144 = 816
D	128x = 3200	1.25 × 3200 = 4000	0.2 × 4000 = 800	4000 - 800 = 3200
E	180x = 4500	1.25 × 4500 = 5625	0.2 × 5625 = 1125	5625 - 1125 = 4500

New selling price = 0.8 × 4500 = Rs. 3600

Required discount percentage = {(5625 – 3600) ÷ 5625} × 100 = 36%

Hence, option C.

B. **Due to some breakage, the shopkeeper had to spent Rs. 250 on article 'C' and then marked it up above its effective cost price and provided discount, by same percentages. The new selling price is how much percent more/less than the original selling price.**

A **31.25%**

B 28.45%

C 42.75%

D 30.15%

Solution

According to the question,

96x + 48x + 32x + 128x + 180x = 12100

Or, 484x = 12100

Or, x = 12100 ÷ 484 = Rs. 25

	Cost price of the article (in Rs.)	Marked price of the article (in Rs.)	Discount offered on the article (in Rs.)	Selling price of the article (in Rs.)
A	96x = 2400	1.25 × 2400 = 3000	0.15 × 3000 = 450	3000 - 450 = 2550
B	48x = 1200	1.2 × 1200 = 1440	0.15 × 1440 = 216	1440 - 216 = 1224
C	32x = 800	1.2 × 800 = 960	0.15 × 960 = 144	960 - 144 = 816
D	128x = 3200	1.25 × 3200 = 4000	0.2 × 4000 = 800	4000 - 800 = 3200
E	180x = 4500	1.25 × 4500 = 5625	0.2 × 5625 = 1125	5625 - 1125 = 4500

New cost price of the article = Rs. (800 + 250) = Rs. 1050

New marked price = 1.2 × 1050 = Rs. 1260

New selling price = 0.85 × 1260 = Rs. 1071

Required percentage change = {(1071 – 816) ÷ 816} × 100 = 31.25%

Hence, option A.

C. **If the article 'A' has been marked up by 30% and same discount amount was offered on it as before, then find the difference between the new selling price and the original selling price.**

A Rs. 135

B **Rs. 120**

C Rs. 180

D Rs. 175

Solution

According to the question,

96x + 48x + 32x + 128x + 180x = 12100

Or, 484x = 12100

Or, x = 12100 ÷ 484 = Rs. 25

	Cost price of the article (in Rs.)	Marked price of the article (in Rs.)	Discount offered on the article (in Rs.)	Selling price of the article (in Rs.)
A	96x = 2400	1.25 × 2400 = 3000	0.15 × 3000 = 450	3000 - 450 = 2550
B	48x = 1200	1.2 × 1200 = 1440	0.15 × 1440 = 216	1440 - 216 = 1224
C	32x = 800	1.2 × 800 = 960	0.15 × 960 = 144	960 - 144 = 816
D	128x = 3200	1.25 × 3200 = 4000	0.2 × 4000 = 800	4000 - 800 = 3200
E	180x = 4500	1.25 × 4500 = 5625	0.2 × 5625 = 1125	5625 - 1125 = 4500

New marked price of the article 'A' = 1.3 × 2400 = Rs. 3120

New selling price = 3120 – 450 = Rs. 2670

Required difference = 2670 – 2550 = Rs. 120

Hence, option B.

D. **If the selling price of the article 'B' had been Rs. 680 more and the discount percentage remained the same, then find the amount by which article 'B' is marked up provided the article is sold at 75% profit.**

A Rs. 1458

B Rs. 1324

C Rs. 1260

D **Rs. 1152**

Solution

According to the question,

$96x + 48x + 32x + 128x + 180x = 12100$

Or, $484x = 12100$

Or, $x = 12100 \div 484 = Rs.\ 25$

	Cost price of the article (in Rs.)	Marked price of the article (in Rs.)	Discount offered on the article (in Rs.)	Selling price of the article (in Rs.)
A	96x = 2400	1.25 × 2400 = 3000	0.15 × 3000 = 450	3000 - 450 = 2550
B	48x = 1200	1.2 × 1200 = 1440	0.15 × 1440 = 216	1440 - 216 = 1224
C	32x = 800	1.2 × 800 = 960	0.15 × 960 = 144	960 - 144 = 816
D	128x = 3200	1.25 × 3200 = 4000	0.2 × 4000 = 800	4000 - 800 = 3200
E	180x = 4500	1.25 × 4500 = 5625	0.2 × 5625 = 1125	5625 - 1125 = 4500

New selling price of article 'B' = 1224 + 680 = Rs. 1904

New marked price of the article 'B' = 1904 ÷ 0.85 = Rs. 2240

New cost price of the article 'B' = 1904 ÷ 1.75 = Rs. 1088

Amount by which article 'B' is marked up = 2240 – 1088 = Rs. 1152

Hence, option D.

E. **If the cost price of the article 'D' had been 80% less then find the difference between the original selling price and the new selling price of the article.**

A Rs. 2432.8

B Rs. 2642.4

C Rs. 2839.6

D Rs. 2547.2

Solution

According to the question,

96x + 48x + 32x + 128x + 180x = 12100

Or, 484x = 12100

Or, x = 12100 ÷ 484 = Rs. 25

	Cost price of the article (in Rs.)	Marked price of the article (in Rs.)	Discount offered on the article (in Rs.)	Selling price of the article (in Rs.)
A	96x = 2400	1.25 × 2400 = 3000	0.15 × 3000 = 450	3000 - 450 = 2550
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C	32x = 800	1.2 × 800 = 960	0.15 × 960 = 144	960 - 144 = 816
D	128x = 3200	1.25 × 3200 = 4000	0.2 × 4000 = 800	4000 - 800 = 3200
E	180x = 4500	1.25 × 4500 = 5625	0.2 × 5625 = 1125	5625 - 1125 = 4500

New cost price of the article = 0.2 × 3200 = Rs. 640

Therefore, marked price of the article = 1.2 × 640 = Rs. 768

New selling price of the article = 0.85 × 768 = Rs. 652.8

Required difference = 3200 – 652.8 = Rs. 2547.2

Hence, option D.

3. **There are two rectangles ‘A’ and ‘B’. The area of rectangle ‘B’ is 20% more than that of ‘A’. The length of both the rectangles are same. The breadth of the rectangle ‘A’ is 5 metres less than that of rectangle ‘B’. Find the breadth of rectangle ‘B’.**

A 40 metres

B **30 metres**

C 45 metres

D 25 metres

Solution

Let the area of rectangle "A" be $x\ m^2$

Therefore, area of rectangle $B = 1.2x\ m^2$

Let the length of rectangle A and B be y metres.

According to the question,

$\frac{1.2x}{y} - \frac{x}{y} = 5$

Or, $\frac{x}{y} = 25$ metres

Therefore, breadth of rectangle $A = 25$ metres

Breadth of rectangle, B = $25 + 5 = 30$ metres

Hence, option B.

4. **A contractor employed 165 women who finished $\frac{11}{16}$th of total work in 40 days. Then, there was a strike, due to which the work stopped for 8 days and 20% work done was also destroyed by the women. After strike, 30 women left the work. In how many days was the whole work completed?**

A **80 days**

B 72 days

C 88 days

D 64 days

Solution

Completed work after strike $= \frac{11}{16} \times 80\% = \frac{11}{20}$

Rest work $= 1 - \frac{11}{20} = \frac{9}{20}$

Let the rest work is completed in x days.

According to the question,

$(165 \times 40) \div (\frac{11}{16}) = (135 \times x) \div \frac{9}{20}$

$x = 32$

The time taken by women to complete the whole work

$= 40 + 32 + 8 = 80$ days

Hence, option A.

5. **The downstream speed of a boat is 12 km/hour more than upstream speed. If boat can travel 180 km in 7.5 hours in still water, then the time taken by boat to travel 360 km in ..... and 240 in ..... is 28 hours.**

The words given in which of the following options will fill the blanks in the same order in which is it given to make the statement true:

I. downstream, downstream

II. downstream, upstream

III. upstream, downstream

A Only I

B Only II and only I

C **Only III**

D Only II and only III

Solution

Let the upstream speed be $x\ km/h$.

Then, the downstream speed $= (x + 12)\ km/h$.

Speed of boat in still water $= 180 \div 7.5 = 24km/h$

So, $(x + x + 12) \div 2 = 24$

$x = 18\ km/h$

So, upstream speed $= 18\ km/h$

Downstream speed $= 30\ km/h$

Option I:

So, time taken by boat to travel $360km$ downstream and 240 downstream $= 360 \div 30 + 240 \div 30 = 12 + 8 = 20$ hours.

So, this cannot be the answer.

Option II:

So, time taken by boat to travel $360km$ downstream and 240 upstream $= 360 \div 30 + 240 \div 18 = 12 + 13.33 \approx 25.33$ hours.

So, this can be the answer.

Hence, option C.

6. **Ritesh has some sum with him. He invested the 75% of the sum in scheme 'A' offering 30% p.a. simple interest for 5 years and received Rs. 27000 as interest. He then invested the amount received from scheme 'A' and the remaining sum with him in scheme 'B' at 20% p.a. compound interest compounded annually for 2 years. Find the interest received by Ritesh from scheme 'B'.**

A Rs. 31630

B Rs. 28340

C Rs. 25620

D **Rs. 22440**

Solution

Let Ritesh invested Rs. x

Aocording to the question,

$\frac{x \times 30 \times 5}{100} = 27000$

Or, $x =$ Rs. 18000

Total sum Ritesh had $= 18000 \div 0.75 =$ Rs. 24000

Amount received by Ritesh from soheme $A = 27000 + 18000 =$ Rs. 45000

Sum invested by Ritesh in scheme ' $B' = 45000 + [0.25 \times 24000] =$ Rs. 51000

Interest received from scheme B $= 51000(1 + \frac{20}{100})^2 - 51000 =$ Rs. 22440

Hence, option D.

7. **Bumrah's bowling average in some matches was 28. After playing one more match (last match) in which he took 6 wickets by giving 102 runs, his bowling average decreased by 1.65. Find the total number of wickets he had taken in all his matches.**

(Bowling average = total number of runs given ÷ total wickets taken)

A 40

B 30

C 25

D 55

Solution

Let total runs given and total wickets taken before the last match be 'x' and 'y' respectively.

So, $x = 28y$

And, $(x + 102) = (28 – 1.65) \times (y + 6)$

$x + 102 = 26.35y + 158.1$

$28y – 26.35y = 56.1$

$1.65y = 56.1$

y = 34

So, total wickets taken by Bumrah = 34 + 6 = 40

Hence, option A.

8. **A mixture contains 140 litres acetone and rest water. 20 litres of water is added to the mixture and then 25% of mixture is taken out. In the taken out mixture, additional amount of acetone which equals to the $\frac{5}{36}$ th of the initial quantity of water is added such that the ratio of acetone to water in the taken out mixture becomes 6:5. Find the total quantity of initial mixture.**

A 300 litres

B 320 litres

C 240 litres

D 360 litres

Solution

Let the initial quantity of water in the mixture be $36x$ litres.

Acoording to the question,

$(0.25 \times 140 + 5x) \div \{0.25 \times (36x + 20)\} = \frac{6}{5}$

Or, $175 + 25x = 30 + 54x$

Or, $29x = 145$

Or, $x = 5$ litres

Therefore, initial quantity of the mixture $= (140 + 36x) = 320$ litres.

Hence, option B.

9. **A two digit number when divided by 5 leaves remainder 3. When the digits of the number are interchanged and divided by 5 leaves remainder 4. The quotient in second case is 7 more than the 1st one. The sum of the digits of the number is 12. What is the original number?**

A 48

B 35

C 27

D 12

Solution

Let the ten's digit be 'a' and unit digit be 'b'.

Therefore, number = 10a + b

When the digits are interchanged, number = 10b + a

Let the quotient in the first and second case be x and y respectively.

According to the question,

$5x + 3 = 10a + b$.... (1)

$5y + 4 = 10b + a$.... (2)

On solving equation (1) and (2), we get

$5(x - y) - 1 = 9a - 9b$

Or, $5(x - x - 7) - 1 = 9a - 9b$

Or, $b - a = 4$.... (3)

Also, $b + a = 12$..... (4)

On solving equation (3) and (4), we get

$2b = 16$

Or, $b = 8$

Therefore, $a = 4$

So, original number = 48

Hence, option A.

10. **Arjun bought a bike for Rs. 54000. He used it for 2 years, and then sold the bike to an automobile company. The value of the bike depreciates at the rate of 10% per year. The company after doing some repair of Rs. 4260 sold the bike to another customer, Vishal at the profit of 10%, then find the price at which Vishal bought the bike.**

A Rs. 53200

B Rs. 50700

C Rs. 51600

D **Rs. 52800**

Solution

According to question,

Cost price of bike for Arjun = Rs. 54000

Cost price of bike for the company after 2 years of use = $54000 \times 0.9 \times 0.9$ = Rs. 43740

So, price at which Vishal bought the bike = $(43740 + 4260) \times 1.1$ = Rs. 52800

Hence, option D.

11. **Two friends, A and B are standing at points P and Q, respectively. If A starts moving towards point Q from point P with speed of (x – 5) km/hr. After 2 hours, B starts moving towards point P from point Q with speed (x + 5) km/hr, and they meet at the midpoint of P and Q. Find the time taken by A to go from point P to point Q, if the distance between point P and point Q is 480 km.**

A 20 hours

B 16 hours

C 12 hours

D 15 hours

Solution

Distance travelled by A in 2 hours $= (x-5) \times 2 = 2(x-5)km$

So, remaining distance between them

$= 480 - 2(x-5) = [490 - 2x)km$

Time of meet of A and

$B = (490 - 2x) \div [(x-5) + [x+5)] = \frac{490-2x}{2x}$ hours

Aooording to question,

$$\frac{490-2x}{2x} \times (x+5) = \frac{480}{2}$$

$$490x - 2x^2 + 2450 - 10x = 480x$$

$$2x^2 = 2450$$

$$x^2 = 2450 \div 2 = 1225$$

$$x = \sqrt{1225} = 35$$

Therefore, required time $= \frac{480}{35-5} = 16$ hours

Hence, option B.

12. **A shopkeeper is giving a discount of 25%, but a customer bargains such that the shopkeeper sells him at Rs. 300 less than he was supposed to sell. If the profit of the shopkeeper is decreased from 80% to 20%, then find the marked price price of the item.**

A Rs. 2400

B Rs. 1800

C Rs. 1500

D Rs. 1200

Solution

Let, marked price of the article be Rs. x

And, cost price of the item = Rs. y

According to question,

1.8y = 0.75x --------(i)

And, 1.2y = 0.75x – 300 ----------(ii)

Using both equations, we get,

1.8y = 1.2y + 300

0.6y = 300

$y = 300 \div 0.6$

$y = Rs.\ 500$

Also, $1.8 \times 500 = 0.75x$

$x = 900 \div 0.75 = Rs.\ 1200$

So, marked price of the item = Rs. 1200

Hence, option D.

13. **Sumit can finish a task in 6 days, while Ravish takes 8 days to finish the same task. If Sumit works for 2 days and then Ravish joins him from the next day and both complete the work, find the percentage of work done by Sumit.**

A 57.4%

B 63.2%

C **71.5%**

D 78.3%

Solution

Let, total work be LCM of 6 and 8 $= 24$ units

Units of work done by Sumit in a day $= 24 \div 6 = 4$ units

Units of work done by Ravish in a day $= 24 \div 8 = 3$ units

Units of work done by Sumit in 4 days $= 4 \times 2 = 8$ units

Remaining work $= 24 - 8 = 16$ units

So, 16 units of work will be done in $\frac{16}{7}$ days

Units of work done by Sumit in $\frac{16}{7}$ days $= 4 \times \frac{16}{7} = \frac{64}{7}$ units

Total units of work done by Sumit $= \frac{64}{7} + 8 = \frac{64+56}{7} = \frac{120}{7}$ units

Required percentage $= \{120 \div (24 \times 7)\} \times 100 \approx 71.5\%$

Hence, option C.

14. **Ankit lent Rs. 7500 at 14% compound interest per annum, and Mayank lent Rs. 3350 at 59% simple interest per annum. If total interest earned by them after 2 years is lent at 20% per annum compound interest in scheme A for 2 years, then find interest earned from scheme A.**

A Rs. 2728

B Rs. 2652

C Rs. 2468

D Rs. 2584

Solution

Interest earned by Ankit in 2 years $= 7500 \times \left\{(1.14)^2 - 1\right\} =$ Rs. 2247

Interest earned by Mayank in 2 years $= 3350 \times 0.59 \times 2 =$ Rs. 3953

Interest earned from scheme $A = (2247 + 3953) \times \left\{(1.2)^2 - 1\right\} =$ Rs. 2728

Hence, option A.

15. **Tina is 8 years younger than Meena while age of Meena is thrice the age of Tony. Difference between age of Tina and Tony is 12 years. What will be the age of Tina after 8 years.**

A **30 years**

B 28 years

C 34 years

D 42 years

Solution

Let, age of Tony = x years

Age of Meena = 3x years

And, age of Tina = (3x – 8) years

Case I: Tina is younger than Tony

So, x – (3x – 8) = 12

x – 3x + 8 = 12

x = -2

Age cannot be negative.

Case II: Tina is older than Tony

So, $3x - 8 - x = 12$

$2x = 20$

$x = 10$

So, present age of Tina = $3x - 8 = 22$ years

Therefore, age of Tina after 8 years = $22 + 8 = 30$ years

Hence, option A.

16. **Read the instruction carefully and answer the given question.**

What value will come in place of the question mark (?) in the following question?

A. 145% **of** $160 + 16$ **of** $5^2 = ? + 124 - \sqrt{144}$

A 480

B 520

C 650

D 280

Solution

145% of $160 + 16$ of $5^2 = ? + 124 - \sqrt{144}$

$232 + 16 \times 25 = ? + 124 - 12$

$? = 232 + 400 - 124 + 12$

$? = 520$

B. $(3375 \times 02197) \div 40\%$ of $65 = ? \div 2 - \left(21 \times 7^{-1}\right)$

A 21

B 33

C 7

D 45

Solution

$(3375 \times 02197) \div 40\%\text{ of }65 = ? \div 2 - \left(21 \times 7^{-1}\right)$

$(15 \times 13) \div 40\%\text{ of }65 = ? \div 2 - (21 \times \frac{1}{7})$

$195 \div 26 = ? \div 2 - 3$

$195 \div 26 = ? \div 2 - 3$

$\frac{15}{2} + 3 = ? \div 2$

$\frac{21}{2} \times 2 = ?$

$? = 21$

C. **55% of 2500 + 20% of 3200 = ? + 40% of 4800**

A 121

B 33

C **95**

D 65

Solution

55% of 2500 + 20% of 3200 = ? + 40% of 4800

1375 + 640 = ? + 1920

? = 95

D. $\left(10^3 \div 5^2\right) \div 2^3 = \sqrt{25} \times ? - \sqrt{3025}$

A 23

B 8

C 34

D 12

Solution

$\left(10^3 \div 5^2\right) \div 2^3 = \sqrt{25} \times ? - \sqrt{3025}$

$(1000 \div 25) \div 8 = 5 \times ? - 55$

$40 \div 8 = 5 \times ? - 55$

$5 = 5 \times ? - 55$

$5 \times ? = 60$

$? = 12$

E. $64\%\ \text{of}\ \left(25\ \text{of}\ \sqrt{100}\right) + \sqrt{(?\ \text{of}\ 7)} = 160\%\ \text{of}\ 5^3 - \sqrt{361}$

A 78

B 19

C **63**

D 56

Solution

$64\%\ \text{of}\ \left(25\ \text{of}\ \sqrt{100}\right) + \sqrt{(?\ \text{of}\ 7)} = 160\%\ \text{of}\ 5^3 - \sqrt{361}$

$(\frac{64}{100}) \times (25 \times 10) + \sqrt{(? \times 7)} = (\frac{160}{100}) \times 125 - 19$

$0.64 \times 250 + \sqrt{(? \times 7)} = 1.6 \times 125 - 19$

$160 + \sqrt{(? \times 7)} = 200 - 19$

$\sqrt{(? \times 7)} = 21$

$? \times 7 = 441$

$? = 63$

17. **The sum of the first 51 terms of the arithmetic progression 2nd term is 2 and 4th term is 8, is _**

A 4336

B **3774**

C 3680

D 5224

Solution

We know that $a_2 = a + d$

Also, $a_4 = a + 3d$

$\Rightarrow 8 = a + 3d$

Subtracting (1) from (2), we have

$\Rightarrow 2d = 6$
$\Rightarrow d = 3$

Substituting $d = 3$ in (1), we get

$\Rightarrow 2 = a + 3$
$\Rightarrow a = -1$

Given that the number of terms $(n) = 51$

First term $a = -1$

So, from equation (A)

$$S_n = (\frac{51}{2}) \times [2(-1) + (51 - 1)(3)]$$
$$\Rightarrow (\frac{51}{2}) \times [-2 + 150]$$
$$\Rightarrow (\frac{51}{2}) \times [148]$$
$$\Rightarrow 3774$$

18. If $4(x + 5) - 3 > 6 - 4x \geq x - 5$; Then the value of x is-

A 1

B 3

C 0

D 2

Solution

$4(x + 5) - 3 > 6 - 4x \geq x - 5$

$4x + 20 - 3 > 6 - 4x \geq x - 5$

$4x + 17 > 6 - 4x \geq x - 5$

Adding 4x in the above equation

$8x + 17 > 6 \geq 5x - 5$

So, $x > -\frac{11}{8}$ and $\frac{11}{5} \geq x$

Therefore, based on options x = 2

19. **Find the sum to n terms of the A.P., whose nth term is 8n + 3.**

A $7n + 5n^2$

B $8n + 4n^2$

C $7n + 3n^2$

D $7n + 4n^2$

Solution

Put $n = 2$

First term $= 8(1) + 3 = 11$

Second term $= 8(2) + 3 = 19$

Sum of first two term $= 11 + 19 = 30$

Check from the option

(1) $7n + 5n^2 = 7(2) + 5(2)^2 = 14 + 20 = 34$

(2) $8n + 4n^2 = 8(2) + 4(2)^2 = 16 + 16 = 32$

(3) $7n + 3n^2 = 7(2) + 3(2)^2 = 14 + 12 = 28$

(4) $7n + 4n^2 = 7(2) + 4(2)^2 = 14 + 1 = 30$

Hence, option D.

20. **Which term of the arithmetic progression 21, 42, 63, 84 .. is 420**

A 20

B 33

C 18

D 4

Solution

$a_1 = 21, a_2 = 42, a_3 = 63, a_4 = 84 \ldots\ldots$

$\Rightarrow d = a_2 - a_1 = 42 - 21 = 21$

Let 420 be then n^{th} term using $a_n = a_1 + (n-1)d$

$\Rightarrow 21 + 21n - 21 = 420$

$\Rightarrow 21n = 420$

$\Rightarrow n = 20$

$=$ 20th term is 420

21. Find the maximum value of x so that 74185x4 is exactly divisible by 4.

A 4

B 2

C 8

D 6

Solution

Divisibility rule for 4: If the last two digits of any given number are divisible by 4 then the given number is also divisible by 4.

If 74185x4 is exactly divisible by 4,

then the value of x can be 2 or 4 or 6 or 8

Hence, the maximum value will be 8.

22. **What should be subtracted from 328541521 so that the number is divisible by 3?**

A 1

B 2

C 4

D 5

Solution

328541521,

Here, we will remove all numbers whose sum or number is divisible by 3.

Sum of the digits of the number = 3 + 2 + 8 + 5 + 4 + 1 + 5 + 2 + 1 = 31

30 is divisible by 3

∴ 31 - 1 = 30

∴ 1 must be subtracted.

23. **In a question of division, divisor is 9 times of quotient and 5 times of reminder. If the remainder is 45, find the dividend.**

A 3260

B 6520

C 4580

D **5670**

Solution

Divisor = 5 times of remainder = $5 \times 45 = 225$

Quotient = $225 \div 9 = 25$

$\therefore$ Dividend = divisor $\times$ quotient + remainder = $225 \times 25 + 45 = 5670$

24. A number when divided by 126, leaves remainder 43. If the same number is divided by 21, the remainder will be.

A 5

B 0

C 1

D 3

Solution

Let the number be $126x + 43$

$126x + 43$ when divided by 21

$$\Rightarrow \frac{126x + 43}{21}$$

$$\Rightarrow \frac{126x}{21} + \frac{43}{21}$$

$$\Rightarrow 6x + \frac{42 + 1}{21}$$

$$\Rightarrow 6x + \frac{42}{21} + \frac{1}{21}$$

$$\Rightarrow 6x + 2 + \frac{1}{21}$$

$\text{Remainder } = 1$

25. **If 2A4B367 is divisible by 11, then find the value of (A + B).**

A 12

B 7

C **10**

D 4

Solution

Number = 2A4B367

⇒ Addition of odd place digits – Addition of even place digits = (2 + 4 + 3 + 7) – (A + B + 6)

⇒ (2 + 4 + 3 + 7) – (A + B + 6) = 11 or 0

⇒ 10 – A – B = 11 or 0

⇒ A + B = 10

∴ The value of A + B is 10.

26. **Pipes 'A' and 'B' are opened daily at same time. On a certain day, when working alone, pipe 'A' can completely fill the tank by 2 p.m. while Pipe 'B' can fill the same tank alone by 12:00 p.m. On the same day, if pipe 'A' works alone till 11:00 a.m., and pipe 'B' takes over from there, then the tank is filled by 1:00 p.m. At what time is the tank opened daily?**

A 9:00 a.m.

B 10:00 a.m.

C 6:00 a.m.

D **8:00 a.m.**

Solution

Let the time taken by pipe 'A' to fill the tank be 'x' hours.

So, time taken by pipe 'B' to fill the tank = (x - 2) hours.

Let the capacity of the tank be x(x - 2) litres.

So, efficiency of pipe 'A' = (x - 2)x ÷ x = (x - 2) litres/hour

And efficiency of pipe 'B' = (x - 2)x ÷ (x - 2) = 'x' litres/hour

Since, pipe 'A' works alone till 11:00 p.m., work done by pipe 'A' = $(x-3) \times (x-2)$ litres

According to question,

$(x-3) \times (x-2) + 2 \times x = x(x-2)$

Or, $x^2 - 5x + 6 + 2x = x^2 - 2x$

Or, $x = 6$

So, pipe 'A' takes 6 hours to fill the tank.

So, pipes are opened at 8:00 a.m. every day.

Hence, option D.

27. **Two fair dies are thrown at once. What is the probability that the sum of obtained numbers is less than 5?**

A $\frac{1}{5}$

B $\frac{1}{6}$

C $\frac{1}{9}$

D $\frac{1}{2}$

Solution

Possible sums $= 2, 3, 4$

Number of ways to get 2 as sum $= (1, 1) = 1$ way

Number of ways to get 3 as sum $= (2, 1)$ and $(1, 2) = 2$ ways

Number of ways to get 4 as sum $= (2, 2), (1, 3)$ and $(3, 1) = 3$ ways

Total number of favourable ways $= 1 + 2 + 3 = 6$

Total possible outcomes $= 6^2 = 36$

So, required probability $= (\frac{6}{36}) = \frac{1}{6}$

28. **'A' and 'B' started a business by investing Rs. 24,000 and Rs. 30,000, respectively. Six months later, 'A' and 'B' increased their investments by 25% and 10%, respectively. At the same point they decided to invite 'C' as a partner in the firm. If 'A', 'B' and 'C' wish to divide profits at the end of the year in ratio of 6:7:3, respectively, then how much amount should 'C' invest?**

A Rs. 36,000

B Rs. 27,000

C Rs. 24,000

D Rs. 21,000

Solution

Let the amount invested by ' C ' be Rs. ' x '

Ratio of profit shares at the end of the year

$$
\begin{gathered}
=\{(24000 \times 6)+(24000 \times 1.25 \times 6)\} \\
:\{(30000 \times 6)+(30000 \times 1.1 \times 6)\}:\{6 x\} \\
=(144000+180000):(180000+198000): 6 x=54000: 63000 \\
: x
\end{gathered}
$$

According to question;

$\frac{x}{63000}=\frac{3}{7}$

Or, $7x = 63000 \times 3$

So, $x = 27000$

So, ' C ' should invest Rs. 27,000

29. **ABCD is a square having area of 16 cm2. 'P' and 'Q' are mid-points of sides AB and BC, respectively. Find the area of the triangle PQD.**

A $8\ cm^2$

B $3\ cm^2$

C $6\ cm^2$

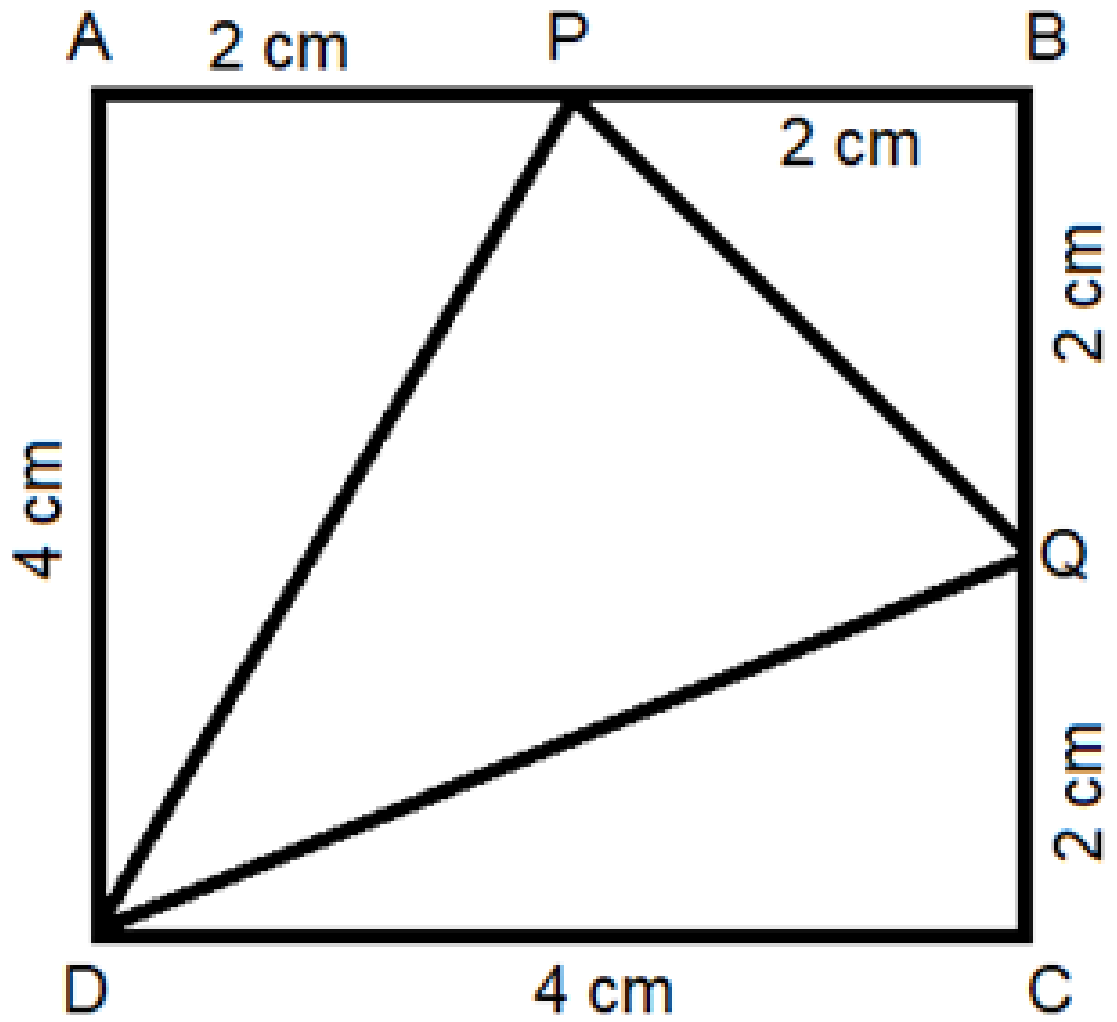
D $7\ cm^2$

Solution

Length of each side of the square = $\sqrt{16} = 4$ cm

So, AB = 4 cm

PB = BC = 2 cm



Required area = Area of square $ABCD$ - (Area of $\triangle APD$+ Area of $\triangle PBQ$+ Area of $\triangle QCD$)

Area of $\triangle APD = \frac{1}{2} \times 2 \times 4 = 4\ cm$

Area of $\triangle QCD = \frac{1}{2} \times 2 \times 4 = 4\ cm$

Area of $\triangle PBQ = \frac{1}{2} \times 2 \times 2 = 2\ cm$

So, required area $= 16 - (4 + 4 + 2) = 6\ cm^2$

30. **A man is walking on a foggy road at a speed of 5 km/h. Due to low visibility, the man can see only up to 600 metres. If the car overtakes the man from behind, then the man can see the car for 3.6 minutes. Find the speed of the car.**

A 20 km/h

B 12 km/h

C 18 km/h

D 15 km/h

Solution

Let the speed of the car be ' x ' km/h.

According to question;

$$\frac{600}{1000 \times (x-5)} = \frac{36}{10 \times 60}$$

$\text{Or, } 10 = x - 5$

$\text{So, } x = 15$

Hence, option D.

31. **A boat takes a total of 9 hours to cover 250 km in downstream and 160 km in upstream. If speed of the stream is 90% less than downstream speed of the boat, then find the time taken by the boat to cover 250 km in upstream.**

A **6.25 hours**

B 12.5 hours

C 7.25 hours

D 8.5 hours

Solution

Let the downstream speed of the boat be ' $10x\ km/h$

So, speed of stream $= 10x \times 0.1 =$ ' x ' km/h

So, upstream speed of the boat $= 10x - x - x =' 8x\ km/h$

According to question;

$\frac{250}{10x} + \frac{160}{8x} = 9$

Or, $25 + 20 = 9x$

Or, $9x = 45$

$x = 5$

So, upstream speed of the boat $= 5 \times 8 = 40\ km/h$

So, required time $= 250 \div 40 = 6.25$ hours.

32. **At what time between 4 and 5 the 2 hands of clock will coincides?**

A $2 : 11\frac{7}{11}$

B $4 : 21\frac{9}{11}$

C $3 : 25\frac{9}{17}$

D None of these

Solution

Minute hand covers 360° in 60 minutes

60 minutes $= 360^\circ$

1 minute $= 360 \div 60$

1 minute $= 6^0$

By applying the formula we can get the answer is:

Angle $= [\frac{11}{2}M \pm 30H]$

The angle between the minute and hour hand should be 0°.

$$\therefore 0 = [\frac{11}{2}M \pm 30 \times 4]$$

$$0 = [\frac{11}{2}M \pm 120]$$

$$120 = \frac{11}{2}M$$

$$120 = 5.5M$$

$$M = 21\frac{9}{11}$$

$$\text{Time } = 4 : 21\frac{9}{11}$$

Thus, the correct answer is $4 : 21\frac{9}{11}$ ".

Where $M =$ minutes and $H =$ hours

33. **Which day of the week will 27th February 2016 be, if 2nd February 2016 is a Tuesday?**

A Monday

B **Saturday**

C Tuesday

D Wednesday

Solution

Given: 2nd February 2016 is a Tuesday

Number of days after 2nd February 2016 till 27th February 2016 = 27 - 2 = 25 days

Now, number of odd days = 25 ÷ 7

⇒ Remainder = 4

⇒ 27th February will be 4 days after Tuesday which is Saturday.

Hence, Saturday is the correct answer.

34.

Directions: Answer the questions based on the information given below.

The table given below shows the statistics of the number of criminal cases filed in Supreme Court. There are only two types of criminal cases i.e. minor and major criminal cases.

Note: Number of criminal cases solved in January = 4000

Month	Percentage increase in the number of criminal cases solved with respect to previous month	Percentage of criminal cases solved out of the total criminal cases filed in the respective month	Number of minor criminal cases filed
February	25%	6.25%	45000
March	25%	10%	37500
April	50%	25%	24000
May	100%	20%	63500
June	20%	15%	94000

A. **What is the percentage increase in the number of criminal cases filed in February to June?**

A 75%

B **87.5%**

C 70%

D 60%

Solution

So, number of criminal cases solved in January = 4000

Number of criminal cases solved in February = 125% of 4000 = 5000

Number of criminal cases solved in March = 125% of 5000 = 6250

Number of criminal cases solved in April = 150% of 6250 = 9375

Number of criminal cases solved in May = 200% of 9375 = 18750

Number of criminal cases solved in June = 120% of 18750 = 22500

Number of criminal cases filed in February = 5000 ÷ 0.0625 = 80000

Number of criminal cases filed in March = 6250 ÷ 0.1 = 62500

Number of criminal cases filed in April = 9375 ÷ 0.25 = 37500

Number of criminal cases filed in May = 18750 ÷ 0.2 = 93750

Number of criminal cases filed in June = 22500 ÷ 0.15 = 150000

Number of major criminal cases filed in February = 80000 – 45000 = 35000

Number of major criminal cases filed in March = 62500 – 37500 = 25000

Number of major criminal cases filed in April = 37500 – 24000 = 13500

Number of major criminal cases filed in May = 93750 – 63500 = 30250

Number of major criminal cases filed in June = 150000 – 94000 = 56000

Required percentage increase = {(150000 – 80000) ÷ 80000} × 100 = 87.5%

Hence, option B.

B. **If 7.5% of the minor criminal cases are solved in February, then what is the number of unsolved minor criminal cases in February?**

A 40725

B 42500

C **41625**

D 44200

Solution

So, number of criminal cases solved in January = 4000

Number of criminal cases solved in February = 125% of 4000 = 5000

Number of criminal cases solved in March = 125% of 5000 = 6250

Number of criminal cases solved in April = 150% of 6250 = 9375

Number of criminal cases solved in May = 200% of 9375 = 18750

Number of criminal cases solved in June = 120% of 18750 = 22500

Number of criminal cases filed in February = 5000 ÷ 0.0625 = 80000

Number of criminal cases filed in March = 6250 ÷ 0.1 = 62500

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Number of major criminal cases filed in February = 80000 – 45000 = 35000

Number of major criminal cases filed in March = 62500 – 37500 = 25000

Number of major criminal cases filed in April = 37500 – 24000 = 13500

Number of major criminal cases filed in May = 93750 – 63500 = 30250

Number of major criminal cases filed in June = 150000 – 94000 = 56000

Number of unsolved minor criminal cases in February = 92.5% of 45000 = 41625

Hence, option C.

C. **Number of major criminal cases filed in April is _% of the number of major criminal cases filed in March.**

The value given in which of the following option will fill the blank to make the above statement true:

A 48%

B 52%

C 54%

D 56%

Solution

So, number of criminal cases solved in January = 4000

Number of criminal cases solved in February = 125% of 4000 = 5000

Number of criminal cases solved in March = 125% of 5000 = 6250

Number of criminal cases solved in April = 150% of 6250 = 9375

Number of criminal cases solved in May = 200% of 9375 = 18750

Number of criminal cases solved in June = 120% of 18750 = 22500

Number of criminal cases filed in February = 5000 ÷ 0.0625 = 80000

Number of criminal cases filed in March = 6250 ÷ 0.1 = 62500

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Number of major criminal cases filed in April = 37500 – 24000 = 13500

Number of major criminal cases filed in May = 93750 – 63500 = 30250

Number of major criminal cases filed in June = 150000 – 94000 = 56000

So, required percentage = 13500 ÷ 25000 × 100 = 54%

Hence, option C.

D. **In which month, major criminal cases filed in Supreme Court is the second highest?**

A **February**

B March

C April

D May

Solution

So, number of criminal cases solved in January = 4000

Number of criminal cases solved in February = 125% of 4000 = 5000

Number of criminal cases solved in March = 125% of 5000 = 6250

Number of criminal cases solved in April = 150% of 6250 = 9375

Number of criminal cases solved in May = 200% of 9375 = 18750

Number of criminal cases solved in June = 120% of 18750 = 22500

Number of criminal cases filed in February = 5000 ÷ 0.0625 = 80000

Number of criminal cases filed in March = 6250 ÷ 0.1 = 62500

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Number of major criminal cases filed in February = 80000 – 45000 = 35000

Number of major criminal cases filed in March = 62500 – 37500 = 25000

Number of major criminal cases filed in April = 37500 – 24000 = 13500

Number of major criminal cases filed in May = 93750 – 63500 = 30250

Number of major criminal cases filed in June = 150000 – 94000 = 56000

So, major criminal cases filed in Supreme Court is the second highest in February i.e. 35000

Hence, option A.

E. **If the ratio of minor to major criminal cases solved in March is 18:7. What is the number of minor cases solved in March?**

A 6300

B 5400

C 5100

D **4500**

Solution

So, number of criminal cases solved in January = 4000

Number of criminal cases solved in February = 125% of 4000 = 5000

Number of criminal cases solved in March = 125% of 5000 = 6250

Number of criminal cases solved in April = 150% of 6250 = 9375

Number of criminal cases solved in May = 200% of 9375 = 18750

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Number of major criminal cases filed in April = 37500 – 24000 = 13500

Number of major criminal cases filed in May = 93750 – 63500 = 30250

Number of major criminal cases filed in June = 150000 – 94000 = 56000

Number of minor criminal cases solved in March = $\frac{18}{25} \times 6250 = 4500$

Hence, option D.

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