RBI Assistant Mains 2017 Quantitative Aptitude Memory Based English

Q.1 B is 6 years older than A. If the ratio of B's age 9 years hence and C's present age is 9 : 8. Average present age of C and D is 25 and age of D is greater than age of C. Difference between sum of present age of A and C to the sum of present age of B and D is 8. What will be age of D after 5 year.

A. 18 years
B. 25 years
C. 31 years
D. 24 years
E. 48 years

Answer: C

Sol:

Let present age of A, B, C and D is a, b, c and d respectively.
Now ATQ
$\Rightarrow b = a + 6$

...(i)
$\Rightarrow \dfrac{b+9}{c} = \dfrac{9}{8} \ or \ \dfrac{a+15}{c} = \dfrac{9}{8}$

$c = \dfrac{8}{9}(a+15) \qquad ...(ii)$

$\Rightarrow c + d = 50 \Rightarrow d = 50 - c$
Now
Difference $= b + d - (a + c) = 8$
Put the value of b, d and c in

$(a+6) + \left(50 - \dfrac{8}{9}(a+15)\right) - \left[a + \dfrac{8}{9}(a+15)\right]$

$= 8$
Solving
a = 12
b = 18
c = 24
d = 26
d's age after 5 year = 26 + 5 = 31

Q.2 If the ratio of curved surface area to the volume of cylinder is 1 : 7 while the ratio of diameter to the height of cylinder is 4 : 3. Find total surface area of cylinder?

A. 3100 sq unit
B. 3180 sq unit
C. 3000sq unit
D. 3080 sq unit
E. None of these

Answer: D

Sol:

$2\pi rh : \pi r^2 h = 1 : 7 (\text{ where r is radius and h is height}) \ 2 : r = 1 : 7$
$\Rightarrow r = 14$
$\Rightarrow diameter : Height \Rightarrow 2r : h = 4 : 3$
$\Rightarrow h = 21$
Total surface area of cylinder $= 2\pi r(r + h)$
$= 2 \times \dfrac{22}{7} \times 14\,(14 + 21)$
$= 88 \times 35$
$= 3080$

Q.3 The average age of mother, father and son was 42 yrs at the time of marriage of the son. After one year an infant was born in the family After 6 yrs of the marriage, the average age of the family is 36 years. What was the age of the bride at the time of marriage.

A. 25 yrs.
B. 23 yrs.

C. 22 yrs.
D. 24 yrs.
E. None of these

Answer: A

Sol:

Sum of the present age of mother, father and son
= 42 × 3 + 6 × 3 = 126 + 18 = 144 years
Sum of the present age of family = 36 × 5 = 180
Present age of bribe = 180 – 144 – 5 = 31 years
Age of the bribe at the time of marriage = 31 – 6 = 25 years.

Q.4 A certain number of trucks were required to transport 60 tons of steel wire from the TISCO factory in Jamshedpur. However, it was found that since each truck could take 0.5 tons of cargo less, another 4 trucks were needed. How many trucks were initially planned to be used?

A. 10
B. 15
C. 20
D. 25
E. 24

Answer: C

Sol:

Let initially x number of truck required

Capacity of one truck $= \frac{60}{x}$

Extra material left due to lower capacity $= \frac{x}{2}$ tons

According to the question,

$$\frac{\frac{x}{2}}{\frac{60}{x} - \frac{1}{2}} = 4$$

$$\Rightarrow \frac{\frac{x}{2}}{\frac{120 - x}{2x}} = 4$$

$$\Rightarrow x^2 + 4x - 480 = 0$$

$$\Rightarrow x = 20$$

So, 20 Trucks were initially used to transport.

Q.5 A cyclist left point A for point B and travelled at the constant speed of 25 km/h. When he covered the distance of 25/3 km, he was overtaken by a car that left point A twelve minutes after the cyclist and travelled at a constant speed too. When the cyclist travelled another 30 km, he encountered the car returning from B. Assume that the car did not stop at point B. Find the distance between A and B.

A. 39.5833 km
B. 41.0833 km
C. 60.833 km
D. 43.33 km
E. 50 km

Answer: C
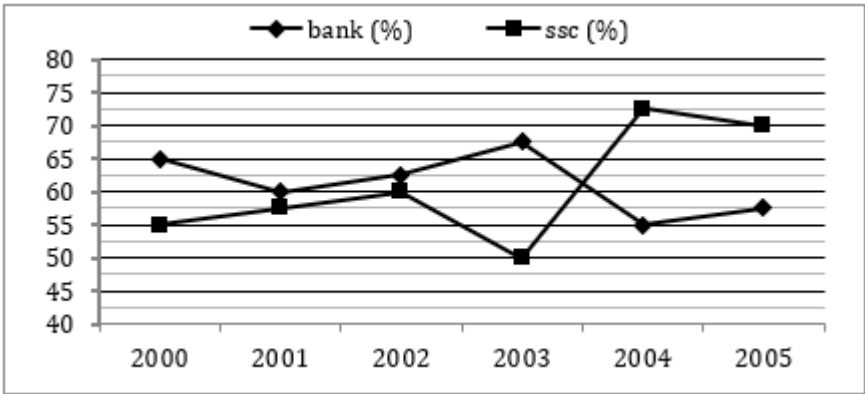
Sol:

Time taken by Cyclist to reach 25/3 km $= \frac{25}{25 \times 3} = \frac{1}{3}$ hr = 20 min

Car has taken to reach 25/3 km = 20 – 12 = 8 min

Speed of Car $= \frac{\frac{25}{3}}{\frac{8}{60}} \times 60 = 62.5$ km/h

Now time taken by cyclist to go further 30 km $= \frac{30}{25} = \frac{6}{5}$ hr = 72 min

Car will go in 72 min $= \frac{72}{60} \times 62.5 = 75$ km

Now, according to question,
Distance between first meeting and second meeting is 30
So,
Distance between first meeting and point B will be $= \frac{75 + 30}{2} = 52.5$ km
Required answer = 52.5 + 8.33 = 60.833 km

Q.6 Number of qualified candidates in BANK exam in 2002 is what percent more or less than the failed candidates of SSC exam in 2001.

Study the data given below carefully and answer the following questions based on these data.

Given below is the table which shows number of students participated (in thousand) in BANK exam and SSC exams from year 2000 to year 2005.

There is also a line graph which shows percentage of qualified students in BANK exam and SSC exam

Year	No. of student (in thousand)	
	BANK	SSC
2000	85	90
2001	90	100
2002	95	105
2003	110	85
2004	80	85
2005	90	95

A. 41%

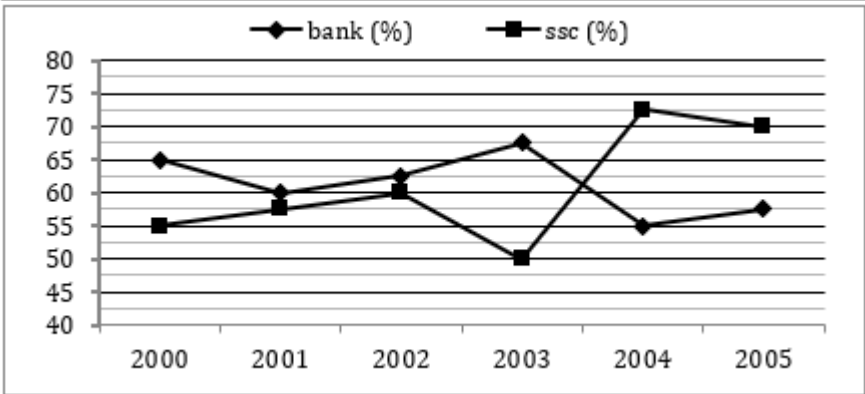B. 39.71%

C. 36.5%

D. 42.5%

E. 35.80%

Answer: B

Sol:

Number of qualified candidates in BANK exam in 2002 $= 95000 \times \frac{62.5}{100} = 59375$

Failed candidates in SSC exam in 2001 $= 100000 \times \frac{42.5}{100} = 42500$

Required percentage $= \frac{59375 - 42500}{42500} \times 100$

$= \frac{16875}{425} \%$

$= 39.70\%$

Q.7 Maximum growth of qualified candidates in BANK exam is recorded in which year ?

Study the data given below carefully and answer the following questions based on these data.

Given below is the table which shows number of students participated (in thousand) in BANK exam and SSC exams from year 2000 to year 2005.

There is also a line graph which shows percentage of qualified students in BANK exam and SSC exam

Year	No. of student (in thousand)	
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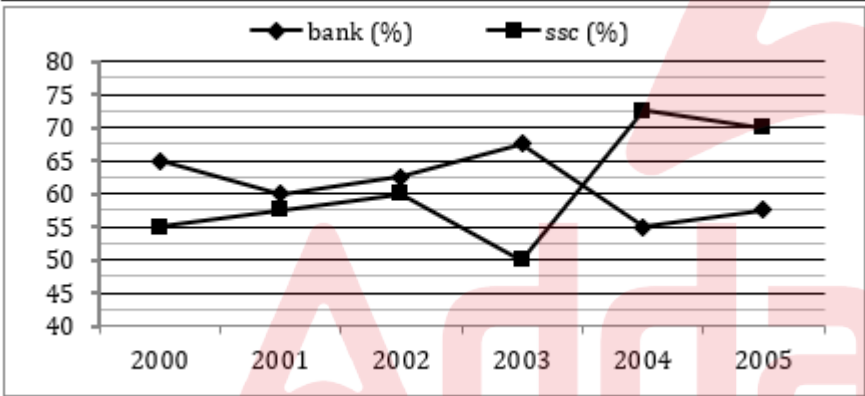

A. 2001

B. 2002

C. 2003

D. 2004

E. 2005

Answer: C

Sol:

Qualified candidates of BANK exam in different year,

In year, $2000 \Rightarrow 85000 \times \dfrac{65}{100} = 55250$

$2001 \Rightarrow 90000 \times \dfrac{60}{100} = 54000$ decrease

$2002 \Rightarrow 95000 \times \dfrac{62.5}{100} = 59375$ increase

$2003 \Rightarrow 110000 \times \dfrac{67.5}{100} = 74250$ increase

$2004 \Rightarrow 80000 \times \dfrac{55}{100} = 44000$ decrease

$2005 \Rightarrow 90000 \times \dfrac{57.5}{100} = 51750$ increase

Maximum growth is recorded in 2003 i.e; 74250 - 59375 = 14875

Q.8 Ratio between the total failed student in 2004 in both exam and qualified student of BANK exam in 2000 is:-

Study the data given below carefully and answer the following questions based on these data.

Given below is the table which shows number of students participated (in thousand) in BANK exam and SSC exams from year 2000 to year 2005.

There is also a line graph which shows percentage of qualified students in BANK exam and SSC exam

Year	No. of student (in thousand)	
	BANK	SSC
2000	85	90
2001	90	100
2002	95	105
2003	110	85
2004	80	85
2005	90	95

A. 351 : 442
B. 451 : 342
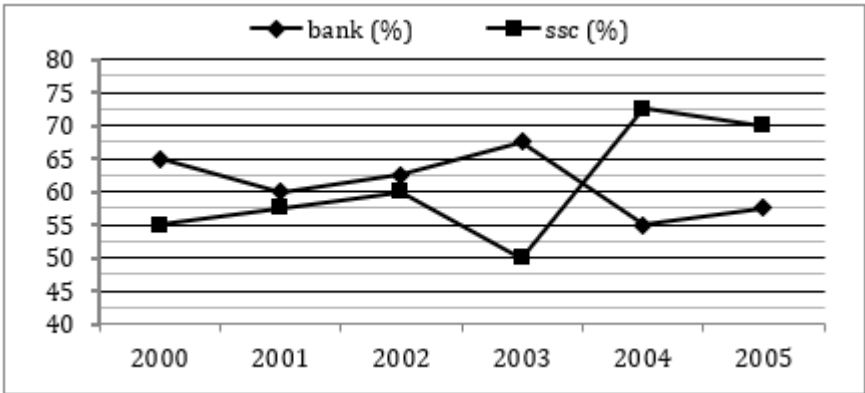C. 442 : 453
D. 229 : 189
E. 475 : 442

Answer: E

Sol:

Total failed student in 2004

$= 80000 \times \dfrac{45}{100} + 85000 \times \dfrac{27.5}{100} = 59375$

Qualified students of BANK exam in 2000 = 55250

Required ratio = 59375 : 55250

= 475 : 442

Q.9 Find the average number of students qualified in SSC exam in all year. (Consider nearest integer).

Study the data given below carefully and answer the following questions based on these data.

Given below is the table which shows number of students participated (in thousand) in BANK exam and SSC exams from year 2000 to year 2005.

There is also a line graph which shows percentage of qualified students in BANK exam and SSC exam

Year	No. of student (in thousand)	
	BANK	SSC
2000	85	90
2001	90	100
2002	95	105
2003	110	85
2004	80	85
2005	90	95

A. 55938
B. 54620
C. 56771
D. 52940
E. 58478

Answer: C

Sol:

Required average

$$= \frac{1}{6}\left[90000 \times \frac{55}{100} + 100000 \times \frac{57.5}{100} + 105000 \times \frac{60}{100} + 85000 \times \frac{50}{100} + 85000 \times \frac{72.5}{100} + 95000 \times \frac{70}{100}\right]$$
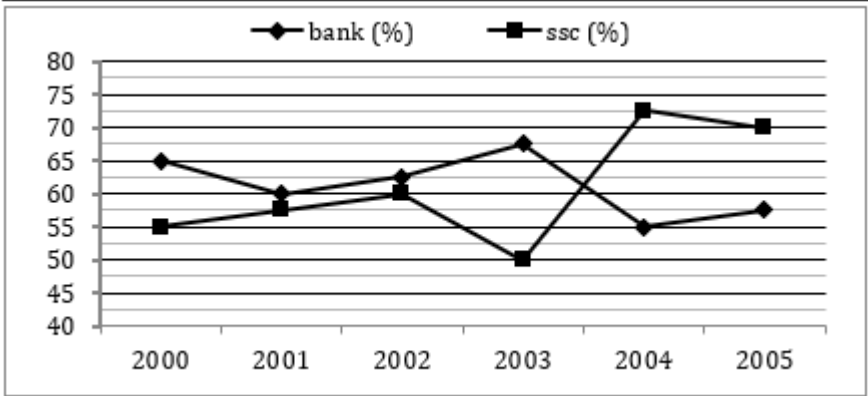
$$= \frac{1}{6}[340625] = 56771$$

Q.10 Find the difference between sum of qualified student of SSC exam in 2002, 2003, 2004 and sum of qualified students of BANK exam in 2001, 2003, 2005.

Study the data given below carefully and answer the following questions based on these data.

Given below is the table which shows number of students participated (in thousand) in BANK exam and SSC exams from year 2000 to year 2005.

There is also a line graph which shows percentage of qualified students in BANK exam and SSC exam

Year	No. of student (in thousand)	
	BANK	SSC
2000	85	90
2001	90	100
2002	95	105
2003	110	85
2004	80	85
2005	90	95

A. 11350
B. 12455
C. 13775
D. 12875
E. 14780

Answer: D

Sol:

Sum of qualified student in SSC exam

$= 105000 \times \frac{60}{100} + 85000 \times \frac{50}{100} + 85000 \times \frac{72.5}{100} = 167125$

Sum of qualified student in BANK exam

$= 90000 \times \frac{60}{100} + 110000 \times \frac{67.5}{100} + 90000 \times \frac{57.5}{100} = 180000$

Required difference = 180000 − 167125 = 12875

Q.11 A sum of money Rs 2550 is to be distributed among Krishna, Vijay and Ramaswami. What will be the share of Vijay?

A. Krishna's share is 1.5 times Vijay's share,

B. Ramaswami's share is half the share of Krishna and Vijay together.

C. The share of Krishna is Rs 340 more than Vijay.

In each of the following questions, 3 statements are given , you have to determine that which statement/statements are necessary to answer the question.

A. Either A and B together or A and C together are sufficient

B. Only A and B together are sufficient

C. Only A and C together are sufficient

D. All statements are required

E. Any 2 of the 3 statements are sufficient

Answer: E

Sol:

St. A –
K : V = 1.5 : 1
St. B –
$R = \frac{1}{2}(K + V)$ St. C –
K = (340 + V)
So using any 2 of the 3 statements we can determine the share of Vijay

Q.12 Find the average of present ages of P, Q and R.

A. The average age of P, Q and R 15 years ago was $33\frac{1}{3}$ years.

B. The present ages of P, Q and R are in the ratio of 8 : 9 : 12.

C. The average age of P, Q and R 15 years hence is $63\frac{1}{3}$ years

In each of the following questions, 3 statements are given , you have to determine that which statement/statements are necessary to answer the question.

A. A and B are sufficient

B. B and C are sufficient

C. Statement B and either statement A or statement C are sufficient

D. Either A or C is sufficient

E. All together are necessary

Answer: D

Sol:

St. A, P + Q + R = 145
St. B, P : Q : R = 8 : 9 : 12
St. C, P + Q + R = 145
So Either A or C is sufficient

Q.13 A, B and C secured 45%, 50% and 60% marks respectively in Biology. D's marks in Biology are 10 more than A's marks and 20 less than C's marks. Find out the overall percentage of marks taking marks of the four students together.

A. The biology has maximum marks 200.

B. Total of D's and A's marks is 190.

C. C has obtained 120 marks.

In each of the following questions, 3 statements are given , you have to determine that which statement/statements are necessary to answer the

question.

A. A and B are sufficient
B. Only A is sufficient
C. Either A and B together or C is sufficient
D. All statements together are necessary
E. The question can be answered even without the use of statements.

Answer: E

Sol:

Difference b/w marks of A and C = 30 marks
marks of A, B, C = 90, 100, 120
and D = A +10 = 100
A + B + C + D = 410
The question can be solved with the help of data given in questions

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Q.14 40 students sit in rows and columns. How many students are seated in each column?
A. The number of rows is 62.50% of the number of columns.
B. The number of rows is 5/8 of the number of columns.
C. The number of rows is less than the number of columns.
In each of the following questions, 3 statements are given , you have to determine that which statement/statements are necessary to answer the question.

A. Only A
B. C and either A or B
C. Only B
D. Either A or B
E. All the statements are required

Answer: D

Sol:

Let there are x no. of columns
St. A – $0.625x \times x = 40, x^2 = 64$
$x = 8$, no. of rows = 5
St. B $\frac{5}{8}x \times x = 40, x^2 = 64, x = 8$
no. of rows = 5
St. C–R < C
So either A or B is sufficient to answer the following questions

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Q.15 What is the total number of coins in a bag containing only 50-paise and one-rupee coins?
A. Total number of coins in the bag is equal to twice the number of 50-paise coins.
B. If the number of 50-paise coins decreased by 50%, the bag would have Rs 62.50.
C. If the number of one-rupee coins is decreased by 20%, the bag will have Rs 65.
In each of the following questions, 3 statements are given , you have to determine that which statement/statements are necessary to answer the question.

A. A and either B or C
B. Any two of the 3 statements
C. Any 1 of the 3 statements
D. Only A and B together
E. All statements are required

Answer: B

Sol:

Let 50 paise coin = x, 1 Rs coin = y
St. A → $x + y = 2x, x = y$
St. B → $\frac{0.5x}{2} + y = 62.5$
St. C → $\frac{x}{2} + 0.8y = 65$
So using any 2 of them we can find the value of x and y

Q.16 If total Indian visitors in November are $2\frac{1}{17}\%$ of the total Indians visitors in October and total visitors are 4/3 rd of the total visitors in June. Then find the difference between foreigner and Indian who visited in November?

Given below is the bar-graph which shows the total number of persons who are visiting Hotel Shivoy in 5 different months of year.
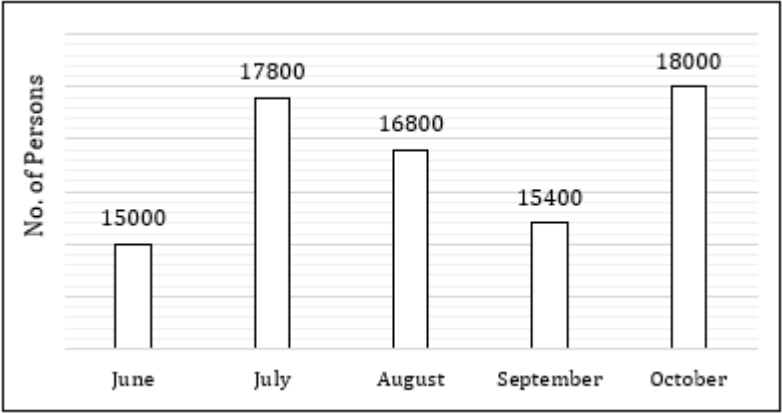

Table shows the percentage of foreigners in total number of persons visiting Hotel Shivoy in different months.

Months	% of persons who are foreigners
June	25%
July	18%
August	18%
September	23%
October	15%

Note- Total person= Indians + foreigners

A. 19820
B. 18315
C. 19370
D. 17370
E. 20210

Answer: C

Sol:

Total Indians in November
$= \frac{35}{1700} \times \frac{85}{100} \times 18000$
$= 315$

Total visitors in November
$= \frac{4}{3} \times 15000 = 20000$

∴ Foreigners visiting in November
$= 20000 - 315 = 19685$

∴ Required difference
$= 19685 - 315 = 19370$

Q.17 If the ratio of male and female foreigners visiting Hotel Shivoy in month of September is 3 : 4, then foreigner males are what percent of foreigner females in September?

Given below is the bar-graph which shows the total number of persons who are visiting Hotel Shivoy in 5 different months of year.
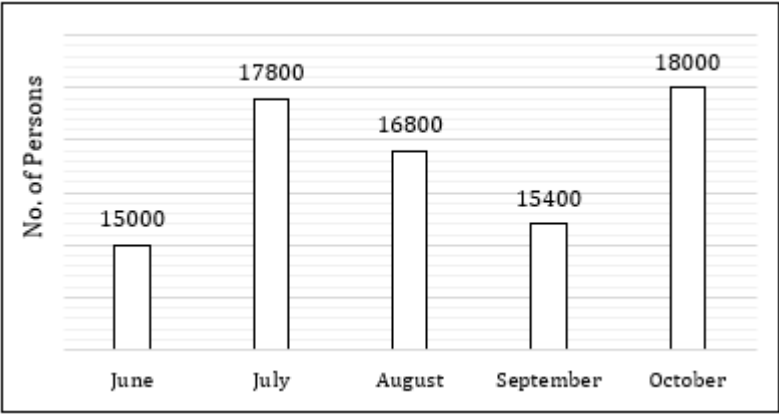

Table shows the percentage of foreigners in total number of persons visiting Hotel Shivoy in different months.

Months	% of persons who are foreigners
June	25%
July	18%
August	18%
September	23%
October	15%

Note- Total person= Indians + foreigners

A. 75%
B. 85%

C. 92%
D. 60%
E. 70%

Answer: A

Sol:

Foreigner Males visiting in September

$$= \frac{3}{7} \times \frac{23}{100} \times 15400$$
$$= 1518$$

Females foreigner in September

$$= \frac{4}{7} \times \frac{23}{100} \times 15400$$
$$= 2024$$

∴ Required percentage $= \frac{1518}{2024} \times 100$
$$= 75\%$$

Alternately,

Required ratio $= \frac{3}{4} \times 100 = 75\%$

Q.18 In month of August, if $33\frac{1}{3}\%$ of foreigners visiting are married and 25% of Indians are also married, while 1/4th of the remaining foreigners are unmarried females and $33\frac{1}{3}\%$ of the remaining Indians are unmarried females. Then find the total number of females visiting Hotel Shivoy in month of August (there are no polygamy males or females)?

Given below is the bar-graph which shows the total number of persons who are visiting Hotel Shivoy in 5 different months of year.
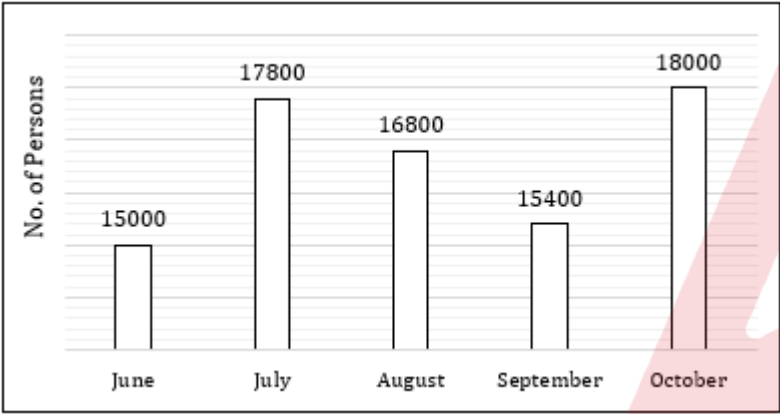

Table shows the percentage of foreigners in total number of persons visiting Hotel Shivoy in different months.

Months	% of persons who are foreigners
June	25%
July	18%
August	18%
September	23%
October	15%

Note- Total person= Indians + foreigners

A. 6252
B. 5468
C. 6220
D. 6174
E. 6184

Answer: D

Sol:

Foreigner who are married

$$= \frac{18}{100} \times 16800 \times \frac{1}{3} = 1008$$

Indians who are married

$$= \frac{82}{100} \times 16800 \times \frac{1}{4} = 3444$$

Remaining unmarried foreign females visitors

$$= \frac{2016}{4} = 504$$

Remaining Indian unmarried females visitors

$$= \frac{10332}{3} = 3444$$

∴ Required total females

$$= \frac{1008}{2} + \frac{3444}{2} + 504 + 3444$$
$$= 6174$$

Q.19 If the ratio of Indian male and female visitors in June is 2 : 3 and ratio of foreigner male & female visitors in August is 1 : 5, then find the ratio of Indian females visitors in June to foreigner males in August?

Given below is the bar-graph which shows the total number of persons who are visiting Hotel Shivoy in 5 different months of year.
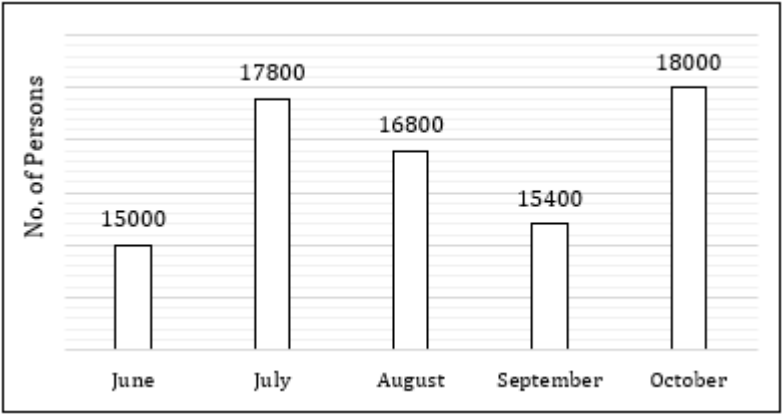

Table shows the percentage of foreigners in total number of persons visiting Hotel Shivoy in different months.

Months	% of persons who are foreigners
June	25%
July	18%
August	18%
September	23%
October	15%

Note- Total person= Indians + foreigners

A. 365 : 28
B. 28 : 375
C. 375 : 28
D. 355 : 28
E. 375 : 23

Answer: C

Sol:

Required ratio

$$= \frac{\frac{3}{5} \times \frac{75}{100} \times 15000}{\frac{1}{6} \times \frac{18}{100} \times 16800}$$

$$= \frac{6750}{504} = 375 : 28$$

Q.20 Foreigner visitors in October are what percent of Indian visitors in June?

Given below is the bar-graph which shows the total number of persons who are visiting Hotel Shivoy in 5 different months of year.
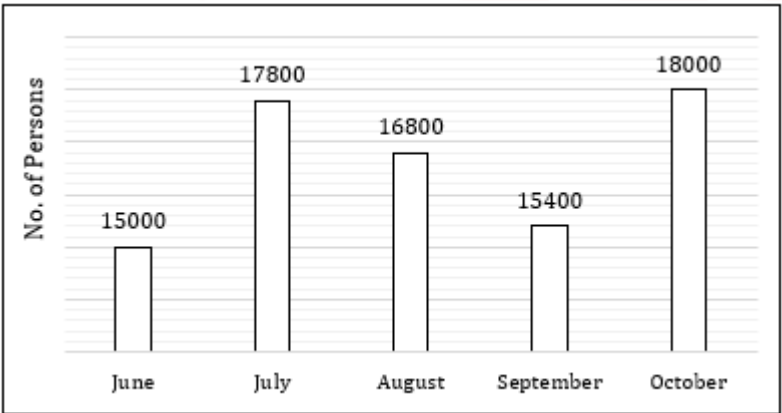

Table shows the percentage of foreigners in total number of persons visiting Hotel Shivoy in different months.

Months	% of persons who are foreigners
June	25%
July	18%
August	18%
September	23%
October	15%

Note- Total person= Indians + foreigners

A. 28%
B. 27%
C. 36%
D. 32%
E. 24%

Answer: E

Sol:

$$\text{Required percentage} = \frac{\frac{15}{100} \times 18000}{\frac{75}{100} \times 15000} \times 100$$
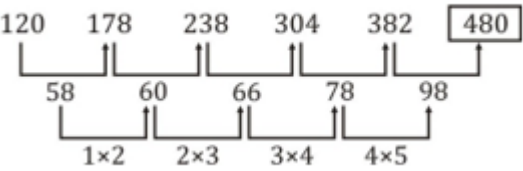
$$= 24\%$$

Q.21 120, 178, 238, 304, 382, ?
What will come in the place of the question mark (?) in the following number series?

A. 400
B. 480
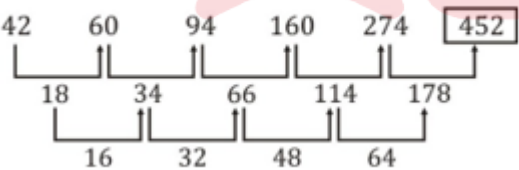C. 420
D. 520
E. 640

Answer: B

Sol:

Pattern is

Q.22 42, 60, 94, 160, 274, ?
What will come in the place of the question mark (?) in the following number series?

A. 472
B. 380
C. 552
D. 452
E. 362

Answer: D

Sol:

Pattern is

Q.23 8, 4, 6, 14, 44, ?
What will come in the place of the question mark (?) in the following number series?

A. 208
B. 192
C. 188
D. 218
E. 212

Answer: A

Sol:
Pattern is,
8 × 0.25 + 2 = 4
4 × 0.5 + 4 = 6
6 × 1 + 8 = 14
44 × 4 + 32 = 208

Q.24 50, 55, 63, 80, 104, ?
What will come in the place of the question mark (?) in the following number series?
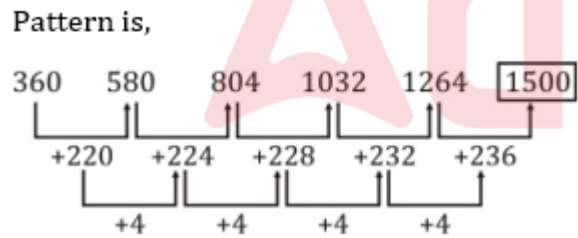
A. 131
B. 145
C. 151
D. 121
E. 141

Answer: E

Sol:
Pattern is
$+2^2+1$, $+3^2-1$, $+4^2+1$, $+5^2-1$, $+6^2+1$
∴ $104 + (6^2 +1) = 104 + 37 = 141$

Q.25 360, 580, 804, 1032, 1264, ?
What will come in the place of the question mark (?) in the following number series?

A. 1400
B. 1500
C. 1600
D. 1560
E. 1540

Answer: B

Sol:

Pattern is,

```
360   580   804   1032   1264   [1500]
   +220   +224   +228   +232   +236
      +4      +4      +4      +4
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Q.26 A dishonest dealer marks up the price of his goods by 20% and gives a discount of 10% to the customer. Besides, he also cheats both his supplier and his buyer by 100 gram while buying or selling 1 kg. Find the percentage profit earned by the shopkeeper.

A. 20%
B. 25%
C. 32%
D. 27.5%
E. None of these

Answer: C

Sol:

Let CP of the 1000gm article = Rs 1000

SP of the 1000gm article(after marking up and giving discount)

$= 1000 \times \frac{120}{100} \times \frac{90}{100}$

$= 1080$

After cheating his supplier, CP of 1100 gm = Rs 1000

$\Rightarrow$ CP of 1000 gm $= 1000 \times \frac{10}{11}$

After cheating his buyer or customer

SP of 900 gm = 1080

SP of 1000 gm $= \frac{1080}{9} \times 10 = 1200$

Profit % $= \frac{1200 - \frac{10000}{11}}{\frac{10000}{11}} \times 100$

$= 32\%$

Q.27 The Lucknow Indore Express without its wagons can go 24 km an hour, and the speed is diminished by a quantity that varies as the square root of the number of wagons attached. If it is known that with four wagons its speed is 20 km/h, the greatest number of wagons with which the engine can just move is

A. 144
B. 140
C. 143
D. 124
E. None of these

Answer: C

Sol:

Decrease in speed of train α

$\sqrt{No.\,of\,wagons\,attached}$

Decrease in speed of train = K

$\sqrt{No.\,of\,wagons\,attached}$

Where k = proportionality constant

ATQ,

$24 - 20 = k\sqrt{4}$

$\frac{4}{2} = k \Rightarrow k = 2$

Number of wagons attached when speed is zero.

$\sqrt{No.\,of\,wagons\,attachment} = \frac{24}{2}$

No. of wagons attached $= (12)^2 = 144$

Max. No. of wagons that can be carried by the engine = 144 – 1 = 143

Q.28 The salary of a person is increased by Rs. 4800 and the rate of income tax is decreased by 2% from 12% to 10%. The effect is such that he is now paying the same income tax as before. If in both the cases, the standard tax(another tax) deduction is fixed at 20% of the total income, find the increased salary?

A. Rs. 32,800
B. Rs. 36,800
C. Rs. 28000
D. Rs. 28,800
E. None of these

Answer: D

Sol:

Let original salary of person =x

ATQ,

x × 0.12 = (x + 4800) × 0.1

0.12x = 0.1x + 480

0.02x = 480

$x = \frac{480}{0.02} = 24,000$

Increased salary = 24,000 + 4800 = 28,800

Q.29 Concentrations of three wines A, B and C are 10%, 20% and 30% respectively. They are mixed in the ratio 2 : 3 : x resulting in a 23% concentration solution, Find x.

A. 7
B. 6
C. 5
D. 4
E. None of these

Answer: C

Sol:

Ratio of concentration of wines = 10% : 20% : 30%
= 1 : 2 : 3
Mixing ratio = 2 : 3 : x

$$\times\left(\begin{matrix} 1 & : & 2 & : & 3 \\ 2 & : & 3 & : & x \end{matrix}\right.$$

Resulting mixture = $\underline{2 \ : \ 6 \ : \ 3x}$ =23
⇒ 2 + 6 + 3x = 23
⇒ x = 5

Q.30 Uday buys rice at Rs. 10/kg and puts a price tag on it so as to earn a profit of 20%. However, his faulty balance shows 1000 gm when it is actually 800 gm. What is his actual gain percentage?

A. 50%
B. 40%
C. 18%
D. 28%
E. 10%

Answer: A

Sol:

CP of 1 kg rice = Rs 10
CP of 800 gm rice = $\frac{10}{1000} \times 800 = Rs\ 8$
SP of 1000 gm rice = 12
Profit percentage = $\frac{12-8}{8} \times 100$
= $\frac{4}{8} \times 100 = 50\%$

Q.31 I. $3x^2 - 35x + 100 = 0$
II. $5y^2 - 49y + 120 = 0$

In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer

A. if x>y
B. if x≥y
C. if x<y
D. if x ≤y
E. if x = y or No relation can be established between x and y.

Answer: B

Sol:

I. $3x^2 - 35x + 100 = 0$

$3x^2 - 15x - 20x + 100 = 0$

$3x (x - 5) - 20 (x - 5) = 0$

$(3x - 20) (x - 5) = 0$

$x = \frac{20}{3}, 5$

II. $5y^2 - 49y + 120 = 0$

$5y^2 - 25y - 24y + 320 = 0$

$5y (y - 5) - 24 (y - 5) = 0$

$(5y - 24) (y - 5) = 0$

$y = \frac{24}{5}, 5$

$x \geq y$

Q.32 I. $2x - 15\sqrt{x} + 28 = 0$

II. $3y - 26\sqrt{y} + 56 = 0$

In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer

A. if x>y

B. if x≥y

C. if x<y

D. if x ≤y

E. if x = y or No relation can be established between x and y.

Answer: D

Sol:

I. $2x - 15\sqrt{x} + 28 = 0$

$2x - 8\sqrt{x} - 7\sqrt{x} + 28 = 0$

$2\sqrt{x}(\sqrt{x} - 4) - 7(\sqrt{x} - 4) = 0$

$(2\sqrt{x} - 7)(\sqrt{x} - 4) = 0$

$\sqrt{x} = \frac{7}{2}, 4$

$x = \frac{49}{4}, 16$

II. $3y - 26\sqrt{y} + 56 = 0$

$3y - 12\sqrt{y} - 14\sqrt{y} + 56 = 0$

$3\sqrt{y}(\sqrt{y} - 4) - 14(\sqrt{y} - 4) = 0$

$(3\sqrt{y} - 14)(\sqrt{y} - 4) = 0$

$\sqrt{y} = \frac{14}{3}, 4$

$y = \frac{196}{9}, 16$

$y \geq x$

Q.33 I. $x^2 = 15^2 - 19^2 + 280$

II. $y = \sqrt{23^2 - 17^2 - 71}$

In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer

A. if x>y

B. if x≥y

C. if x<y

D. if x ≤y

E. if x = y or No relation can be established between x and y.

Answer: C

Sol:

    I. $x^2 = 15^2 - 19^2 + 280$
    $= 225 - 361 + 280$
    $= 144$
    $\Rightarrow x = \pm 12$

    II. $y = \sqrt{529 - 289 - 71} = \sqrt{169}$
    $y = 13$
    $y > x$

Q.34   I. $2x^2 + 9\sqrt{3}x + 27 = 0$
      II. $5y^2 + 36\sqrt{3} + 192 = 0$
      In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer

    A. if x>y
    B. if x≥y
    C. if x<y
    D. if x ≤y
    E. if x = y or No relation can be established between x and y.

Answer: A

Sol:

    I. $2x^2 + 9\sqrt{3}x + 27 = 0$
    $2x^2 + 6\sqrt{3}x + 3\sqrt{3}x + 27 = 0$
    $2x(x + 3\sqrt{3}) + 3\sqrt{3}(x + 3\sqrt{3}) = 0$
    $(2x + 3\sqrt{3})(x + 3\sqrt{3}) = 0$
    $x = -3\sqrt{3}, -\frac{3\sqrt{3}}{2}$

    II. $5y^2 + 36\sqrt{3}y + 192 = 0$
    $5y^2 + 20\sqrt{3}y + 16\sqrt{3}y + 192 = 0$
    $5y(y + 4\sqrt{3}) + 16\sqrt{3}(y + 4\sqrt{3}) = 0$
    $(5y + 16\sqrt{3})(y + 4\sqrt{3}) = 0$
    $y = -4\sqrt{3}, \frac{-16\sqrt{3}}{5}$
    $x > y$

Q.35   I. $2x^2 - 41x + 210 = 0$
      II. $2y^2 - 39y + 190 = 0$
      In each of these questions, two equations (I) and (II) are given. You have to solve both the equations and give answer

    A. if x>y
    B. if x≥y
    C. if x<y
    D. if x ≤y
    E. if x = y or No relation can be established between x and y.

Answer: B

Sol:

    I. $2x^2 - 41x + 210 = 0$
    $2x^2 - 20x - 21x + 210 = 0$
    $2x(x - 10) - 21(x - 10) = 0$
    $x = 10, \frac{21}{2}$

    II. $2y^2 - 39y + 190 = 0$
    $2y^2 - 20y - 19y + 190 = 0$
    $2y(y - 10) - 19(y - 10) = 0$
    $y = 10, \frac{19}{2}$
    $x \geq y$

Q.36 A man can row a distance of 2 km upstream in 15 minutes and returns the same distance in 10 minutes. How much time will he take to row the same distance upstream if due to a tide the speed of the current gets doubled ?

A. 25 minutes
B. 45 minutes
C. 20 minutes
D. 30 minutes
E. 40 minutes

Answer: C

Sol:

Let speed of man be x km/hr and that of current be r kmph.
$\frac{2}{x-r} = \frac{15}{60}$ or, $x - r = 8$ ....(i) $\frac{2}{x+r} = \frac{10}{60}$ or, $x + r = 12$ ......(ii) Solving (i) and (ii),
$x = 10, r = 2$
Required time $= \frac{2}{10-4} = \frac{2}{6} = \frac{1}{3}$ hr. $= \frac{1}{3}$ hr = 20 minutes

Q.37 Two trains have respective lengths as 230 m and 190 m. They cross each other completely in 21 s if they are travelling in the opposite direction and in 42 s if they are traveling in the same direction. Find the ratio of the speed of the two trains.

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

Answer: A

Sol:

Let speed of longer train be x and that of shorter train be y.
Then, $\frac{x+y}{x-y} = \frac{42}{21}$
or, $x + y = 2x - 2y$
or, $x = 3y$
or, $\frac{x}{y} = \frac{3}{1}$

Q.38 A person has 12 friends of whom 8 are relatives. In how many ways can he invite 7 friends such that at least 5 of them are relatives ?

A. 284
B. 384
C. 456
D. 512
E. 428

Answer: C

Sol:

No. of ways $= {}^8C_5 \times {}^4C_2 + {}^8C_6 \times {}^4C_1 + {}^8C_7$
$= \frac{8 \times 7 \times 6}{3 \times 2} \times \frac{4 \times 3}{2} + \frac{8 \times 7}{2} \times 4 + 8$
$= 456$

Q.39 The diameter of a road-roller is 42 cm and its length is 100 cm. It takes 400 complete revolutions moving once over to level the stretch of the road. If the cost of leveling is Rs. 100 per m2 then the total cost of leveling works out to

A. Rs. 52,800
B. Rs. 5,280
C. Rs.5,28,000
D. Rs. 528
E. Rs. 5.28

Answer: A

Sol:

Area leveled by roller = $400 \times 2 \times \frac{22}{7} \times \frac{0.42}{2} \times 1$

$= 528 \, m^2$

Total cost = $528 \times 100 = $ Rs. 52800

Q.40 The biggest possible cube is taken out of a right solid cylinder of radius 15 cm and height 20 cm respectively. What will be the volume (in cm^3) of the cube?

A. 8750
B. 6750√2
C. 3750√2
D. 7500
E. 8000

Answer: E

Sol:

For the biggest cube, face diagonal of cube = diameter of cylinder

$\sqrt{2}a = 30$

or, $a = 15\sqrt{2}$ But 'a' can't be greater than 20cm $\therefore a = 20cm$

Volume = $a^3 = 20^3 = 8000 \text{ cm}^3$