## Data Interpretation

## (The answers are marked in bold)

Directions for question 1 to 4: Answer the questions on the basis of the following charts.



1. In Afghanistan, registered foreigners increased by $10 \%$ every 2 years. In 2008, $40 \%$ of the foreigners were unregistered. What was the total population of Afghanistan in 2008?
A. 180.4 million
B. $\mathbf{1 2 3}$ million
C. 96 million
D. 82 million

Solution: The number of registered foreigners in 2012 is 1.21 times (1.1) ${ }^{2}$ the number of registered foreigners in 2008 (as the their number increases $10 \%$ every 2 years)

So, registered foreigners in $2008=(2.7 / 121) \times 100=2.23$ million
Therefore total foreigners in $2008=(2.23 / 60) \times 100=3.7$ million.
So, total population of Afghanistan in $2008=(3.7 / 3) \times 100 \approx 123$ million.

Correct option: B
2. In 2012, registered foreigners were 4\% of the total population. From 2000 to 2012, the total population increased by 55\% and the number of registered foreigners increased by $670 \%$. By what amount did the number of unregistered foreigners increase from 2000 to 2012?

## A. $\mathbf{1 . 2 6 5}$ million

B. 0.265 million
C. 2.265 million
D. 1.045 million

Solution: In 2012, total registered foreigners $=2.7$ million.
Therefore total population $=(2.7 / 4) \times 100=67.5$ million.
So, total population in $2000=67.5 / 1.55=43.5$ million

Total registered foreigners in $2000=2.7 / 7.7=0.35$ million
In 2012, total number of registered foreigners $=4 \%$ and total foreigners $=6 \%$
Therefore, unregistered foreigners account for $2 \%$ of the total population
Total number of unregistered foreigners in $2012=67.5 \times 0.02=1.35$ million
Total number of unregistered foreignersin $2000=43.5 \times 0.01-0.35=0.085$ million.
Hence the required increase $=1.35-0.085=1.265$ million.
Correct option: A
3. In 2010, the total population increased by $50 \%$ over that in 2004. In 2004, foreigners from India were y\% of the total foreigners and this percentage
increased by $10 \%$ points in 2010. In 2010, foreigners from India decreased by 20 $\%$ over that in 2004. What is the value of y (approx)?
A. 20
B. 9
C. 13
D. 7

Solution: Let x be the total population in 2004.
So total population in $2010=1.5 x$
Total foreigners in $2004=0.02 \mathrm{x}$
Total foreigners in $2010=0.075 \mathrm{x}$
Total foreigners from India in $2004=(0.02 \mathrm{xy}) / 100$
Total foreigners from India in $2010=[0.075 x(y+10) / 100]$
So, $(0.02 x y) / 100-[0.075 x(y+10) / 100] /[(0.02 x y) / 100] * 100=20$
$Y=12.71 \%$

Correct option: C
4. The number of registered foreigners from Bangladesh increases by $10 \%$ every 2 years and that of unregistered foreigners from Bangladesh decreases by $10 \%$ every 2 years. If the total population of Afghanistan remains the same for all years and the number of foreigners from Bangladesh are $2 \%$ of the total population in

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2012, then how many unregistered Bangladeshis were present in 2006. [In 2006, there were no foreigners in Afghanistan from any country except Bangladesh]
A. 3 million
B. 4 million
C. 5 million
D. 6 million

Solution: Let the number of registered foreigners and unregistered foreigners from Bangladesh in 2006 be $x$ and $y$ respectively.

Number of registered foreigners from Bangladesh in $2012=1.331 x$
Number of registered foreigners from Bangladesh in $2006=x=(2.7 \times 0.39) / 1.331$ $=0.79$ million

Let z be the total population.
$0.79+y=0.025 z \ldots . .(\ln 2006)$
And $1.053+0.729 y=0.02 z \ldots .(\ln 2012)$
Solving for $\mathrm{y}, \mathrm{y}=5.9$ million.
Correct option: D

Directions for question 5 to 7: Type your answers based on the information given.
In Cricket premier league, 8 teams participate. Each team played with every other team thrice in the group stage of the tournament. A win will credit 4 points, a tie will credit 2 points and there is no point for a loss. Top 4 teams will qualify for the semifinals. In case the total points for the teams are equal the ranking is decided based on the run rate.

Note: The net run rate for each team is different.
5. What can be the minimum points scored by the team to qualify for the semifinals?
$\square$

Answer: 24
Solution: Total number of matches played in the group stage of the tournament ${ }^{8} C_{2} * 3=84$

Total points in the tournament $=84 * 4=336$
Consider the top three teams got the maximum points i.e., top team won all the matches, team finishing $2^{\text {nd }}$ lost only against the first team and similarly the team finishing $3^{\text {rd }}$ lost only against first two teams.

So, the net points scored by the top 3 teams is $84+72+60=216$
Now points left for the last five teams is 336-216 $=120$
So, minimum points needed to qualify is ensured when the points are divided equally among the remaining 5 teams $=120 / 5=24$ points
6. What can be the maximum points scored by the team which finishes $5^{\text {th }}$ in the group stage matches ?
$\square$

Answer: 60
Solution: To maximize the number of points scored by the team that finishes $5^{\text {th }}$, we need to minimize the points scored by the last 3 teams.

Matches played by the last 3 teams $={ }^{3} \mathrm{C}_{2} * 3=9$
Points scored by the last 3 teams $=9 * 4=36$
Total points of the tournament $=336$
Remaining points $=336-36=300$
Maximum points scored by the team $=300 / 5=60$ points.
7. What can be the sum of maximum points scored by the team which came $1^{\text {st }}$ and the team which came last?


Answer: 120
Solution: If the first team won all the matches, then the points scored by the team finishing $1^{\text {st }}$ will be 84 .

Now consider all the other matches end in a draw
Total points $=336-84=252$
Dividing these points equally among the last 7 teams, we get $252 / 7=36$ points.

Total points scored by $1^{\text {st }}+8^{\text {th }}$ team $=84+36=120$.

Directions for question 8 to 12: Answer the following questions on the basis of the following pie charts:

There was a census conducted to estimate the number of people who were not from the local population in five different cities: A, B, C, D and E.

The table below shows the number of people who constituted a part of this non-local population in 5 consecutive years

|  | 2001 | 2002 | 2003 | 2004 | 2005 |
| :--- | :--- | :--- | :--- | :--- | :--- |
| City A | 9372 | 11252 | 6127 | 12345 | 9877 |
| City B | 10765 | 8328 | 7056 | 9362 | 13125 |
| City C | 12823 | 11675 | 13157 | 14106 | 16132 |
| City D | 7352 | 9137 | 11346 | 13451 | 15769 |
| City E | 8767 | 10789 | 12523 | 14323 | 16239 |

GRAPH 1- Percentage share of the three types of non-locals in these Cities


GRAPH 2- Percentage distribution of Indians


GRAPH 3- Percentage distribution of NRIs


GRAPH 4- Percentage distribution of Foreign Nationals

8)In 2005, what is the difference between the non-local NRI population from America and the European category of Foreign Nationals?
a) 9200
b) 10234
c) 8644
d) $\mathbf{8 7 3 8}$

Solution: Solutions for questions

|  | $\mathbf{2 0 0 1}$ | $\mathbf{2 0 0 2}$ | $\mathbf{2 0 0 3}$ | $\mathbf{2 0 0 4}$ | $\mathbf{2 0 0 5}$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| City A | 9372 | 11252 | 6127 | 12345 | 9877 | $\mathbf{4 8 9 7 3}$ |
| City B | 10765 | 8328 | 7056 | 9362 | 13125 | $\mathbf{4 8 6 3 6}$ |
| City C | 12823 | 11675 | 13157 | 14106 | 16132 | $\mathbf{6 7 8 9 3}$ |
| City D | 7352 | 9137 | 11346 | 13451 | 15769 | $\mathbf{5 7 0 5 5}$ |
| City E | 8767 | 10789 | 12523 | 14323 | 16239 | $\mathbf{6 2 6 4 1}$ |
|  | $\mathbf{4 9 0 7 9}$ | $\mathbf{5 1 1 8 1}$ | $\mathbf{5 0 2 0 9}$ | $\mathbf{6 3 5 8 7}$ | $\mathbf{7 1 1 4 2}$ |  |

Total non-local floating population in 2005=71142
Number of people from the NRI category= $55 \%$ of $71142=39128$
Number of people from the American NRI category $=27.8 \%$ of $39128=10878$
Number of people from the Foreign Nationals category $=18.8 \%$ of $71142=$ 13375

Number of European NRI's $=16 \%$ of $13375=2140$

Difference $=10878-2140=8738$

Correct option: D
9)What is the percentage change in the percentage increase in the number of non-local North Indian people in City A and Foreign Nationals of the Asian category in City D, from 2001 to 2002?
a) $11 \%$
b) $\mathbf{2 0 \%}$
c) $16 \%$
d) $31 \%$

Solution:

|  | $\mathbf{2 0 0 1}$ | $\mathbf{2 0 0 2}$ | $\mathbf{2 0 0 3}$ | $\mathbf{2 0 0 4}$ | $\mathbf{2 0 0 5}$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| City A | 9372 | 11252 | 6127 | 12345 | 9877 | $\mathbf{4 8 9 7 3}$ |
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It seems that the calculation is intensive, but you should realize that most of the numbers cancel out

Number of non-local North Indian people in City A in 2001= 17\% of 26.2\% of 9372

Number of non-local North Indian people in City A in 2002=17\% of 26.2\% of 11252

Hence, percentage change is $\left[\frac{11252-9372}{9372}\right] * 100 \%=20 \%$
Foreign Nationals of the Asian category in City D in 2001= 46\% of 18.8\% of 7352

Non-local Foreign Nationals of the Asian category in City D in 2002=46\% of 18.8\% of 9137

Hence, percentage change is $\left[\frac{9137-7352}{7352}\right] * 100 \%=24 \%$
Percentage change in percentage increase $=\frac{4}{20} * 100=20 \%$.
Correct option: B
10) The average amount spent by an American Foreign National for staying in a hotel in city E is Rs 3800 . The average amount spent by a North Indian for staying in a hotel in city D is Rs 2375 . What is the difference in expenditure on hotel stay by these two non-local groups over the given period?
(Assume that all the individuals in the above mentioned groups stay in hotels during this period)
a) 350

## b) 291.5

c) 300
d) 250.25

Solution:

|  | $\mathbf{2 0 0 1}$ | $\mathbf{2 0 0 2}$ | $\mathbf{2 0 0 3}$ | $\mathbf{2 0 0 4}$ | $\mathbf{2 0 0 5}$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| City A | 9372 | 11252 | 6127 | 12345 | 9877 | $\mathbf{4 8 9 7 3}$ |
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Number of non-local people from the American Foreign National category in City E in this period $=20 \%$ of $18.8 \%$ of $62641=2355$ thousand

Total expenditure on hotels in this period in City E due to the American Foreign National category $=(3800 * 2355$ thousand $)=$ Rs 895 crore

Number of non-local people in City D from the North Indian category in this period $=17 \%$ of $26.2 \%$ of $57055=$

2541 thousand
Total expenditure on hotels in this period in City D due to the North Indian category $=(2375 * 2541$ thousand $)=$

## Rs 603.5 crore

Difference in expenditure $=291.5$ crore .
Correct option: B
11) What is the percentage increase in the number of Foreign Nationals from the category "others" over the given period?
a) $45 \%$
b) $65 \%$
c) $76 \%$
d) $52 \%$

Solution:

|  | $\mathbf{2 0 0 1}$ | $\mathbf{2 0 0 2}$ | $\mathbf{2 0 0 3}$ | $\mathbf{2 0 0 4}$ | $\mathbf{2 0 0 5}$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| City A | 9372 | 11252 | 6127 | 12345 | 9877 | $\mathbf{4 8 9 7 3}$ |
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Since the percentages remain the same, as in the second question of this caselet, we can take the total of2001 and 2005 to consider the percentage increase percentage increase $=\left[\frac{71142-49079}{49079}\right] * 100 \%=45 \%$.
12) What is the highest percentage growth in the number of non-local people from East India, between any two consecutive years?
a) $30 \%$
b) $\mathbf{2 7 \%}$
c) $21 \%$
d) $32 \%$

Solutions for questions

|  | $\mathbf{2 0 0 1}$ | $\mathbf{2 0 0 2}$ | $\mathbf{2 0 0 3}$ | $\mathbf{2 0 0 4}$ | $\mathbf{2 0 0 5}$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
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By simple observation, it can be deduced that the highest percentage change occurs from 2003 to 2004.

This percentage change can be computed as $\frac{63587-50209}{50209} \approx 27 \%$ (note that the sub groups do not matter, as they eventually get cancelled out).

Direction for Question 13-15: Type the answers in the space provided for the following questions

The following graph gives details of change in sales and profit of six companies in 2014 compared to the previous year. Assume all companies in the year 2013

Expenses $=$ Sales - Profit
Profit Margin = Profit/Sales

13. How many of the given companies definitely had a decrease in profit margin in 2014 compared to 2013?
$\square$
Answer: 2
Solution: Since profit margin = profit/sales
For companies $\mathrm{Y}, \mathrm{Z}$, and M nothing can be concluded as percentage change in sales or profit is not known. For company N sales remained the same and the profit decreased, while for company $P$ sales increased and the profit decreased. Both these companies definitely had a decrease in profit margins.
14. For how many of the given companies it can be definitely said that there was a decrease in expenses in 2014 compared to 2013?


## Answer: 1

Solution: Using the same logic as in the previous question, only for company X can be definitely said that there was a decrease in expenses.
15. For how many of the given companies was there a negative correlation between sales and profits (i.e. Increase in sales and decrease in profits and vice versa) in 2014 compared to 2013?
$\square$
Answer: 2

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Solution: For companies $X$ and $P$

