

Directions for Questions 26 to 28:

Answer the following questions based on the information given below:

For admission to various affiliated colleges, a university conducts a written test with four different sections, each with a maximum of 50 marks. The following table gives the aggregate as well as the sectional cut-off marks fixed by six different colleges affiliated to the university. A student will get admission only if he/she gets marks greater than or equal to the cut-off marks in each of the sections and his/her aggregate marks are at least equal to the aggregate cut-off marks as specified by the college.

	Sectional Cut-offs Marks				Aggregate Cut-offs Marks
	Section A	Section B	Section C	Section D	
College 1	42	42	42		176
College 2		45	45		175
College 3			46		171
College 4	43			45	178
College 5	45		43		180
College 6		41		44	176

26. Aditya did not get a call from even a single college. What could be the maximum aggregate marks obtained by him?

- (1) 181
- (2) 176
- (3) 184
- (4) 196
- (5) 190

Soln: The cut-off marks in section C, for colleges 1, 2, 3 and 5 are 42, 45, 46 and 43 respectively. If Aditya gets 41 marks in section C, he will not get a call from any of these four colleges. For section D, the cut-off marks are 45 and 44 respectively for colleges 4 and 6 and he gets 43 marks. So he will not get a call from these two colleges also. That means he will not get a call from any of these six colleges as his maximum marks in sections A, B, C and D will be 50, 50, 41 and 43 respectively. Therefore, the total maximum possible marks are $50 + 50 + 41 + 43 = 184$. Hence, the answer is option (3).

27. Bhama got calls from all colleges. What could be the minimum aggregate marks obtained by her?

- (1) 180

- (2) 181
- (3) 196
- (4) 176
- (5) 184

Soln: Consider maximum cut-off for A, B, C and D are 45, 45, 46 and 45 respectively. therefore, Aggregate = $45 + 45 + 46 + 45 = 181$
Hence, answer is option (2).

28. Charlie got calls from two colleges. What could be the minimum marks obtained by him in a section?

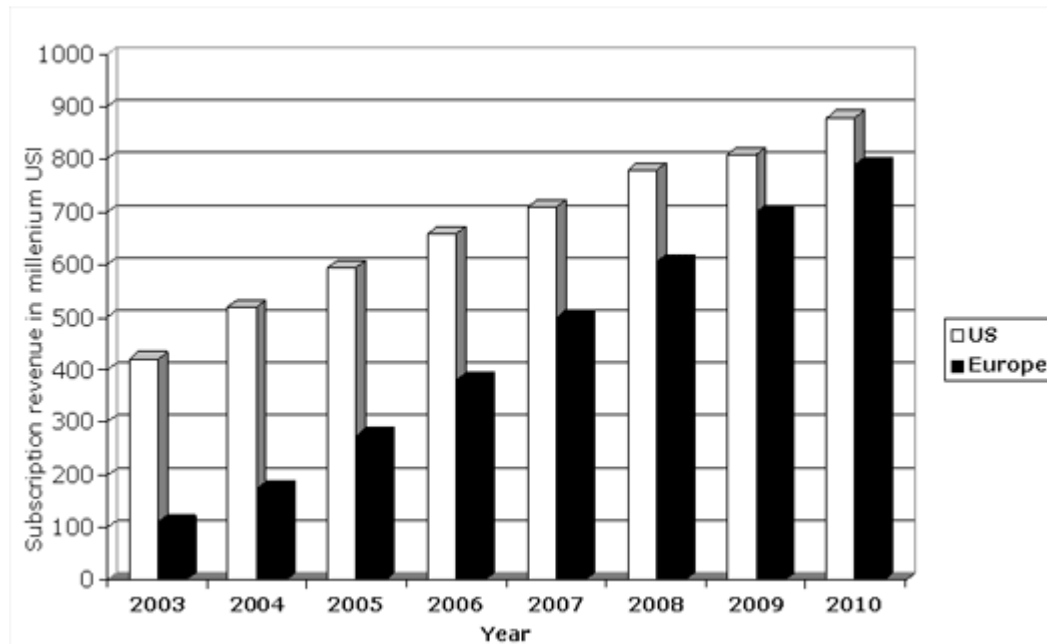
- (1) 0
- (2) 21
- (3) 25
- (4) 35
- (5) 41

Soln: Let us assume, Charlie got 50 marks each in sections A, B and C. So, the total marks in the three sections are 150.
If Charlie got calls from college 2 and college 3, considering cut-off of section D in both colleges is less than 25.
Therefore, minimum marks required in section D should be $175 - 150 = 25$.
Hence, answer is option (3).

Directions for Questions 29 to 32:

Answer the following questions based on the information given below:

The bar chart below shows the revenue received, in million U.S. Dollars (USD), from subscribers to a particular Internet service. The data covers the period 2003 to 2007 for the United States (US) and Europe. The bar chart also shows the estimated revenues from subscription to this service for the period 2008 to 2010.



29. While the subscription in Europe has been growing steadily towards that of the US, the growth rate in Europe seems to be declining. Which of the following is closest to the percent change in growth rate of 2007 (over 2006) relative to the growth rate of 2005 (over 2004)?

- (1) 17
- (2) 20
- (3) 35
- (4) 60
- (5) 100

Soln: Revenue in Europe in 2007 = 500
Revenue in Europe in 2006 = 380

$$\text{Growth rate of 2007} = \frac{500 - 380}{380} * 100 = 32\%$$

Revenue in Europe in 2005 = 270
Revenue in Europe in 2004 = 180

$$\text{Growth rate of 2005} = \frac{270 - 180}{180} * 100 = 50\%$$

$$\text{Percentage change} = \frac{50 - 32}{50} * 100 = \frac{18}{50} * 100 = 35\%$$

Hence, answer is option (3).

30. The difference between the estimated subscription in Europe in 2008 and what

it would have been if it were computed using the percentage growth rate of 2007 (over 2006), is closest to:

- (1) 50
- (2) 80
- (3) 20
- (4) 10
- (5) 0

Soln: Estimated subscription in Europe for 2008 (in million US dollars) = 600
 Percentage growth rate for subscription in Europe for 2007 over

$$2006 = \frac{500 - 380}{380} = \frac{6}{19}$$

Subscription in Europe for 2008 computation as per 2007 (over 2006)

$$= 500 \left(1 + \frac{6}{19} \right) \approx 650$$

Approximate difference in these two values = 650 - 600 = 50

Hence, answer is option (1).

- 31.** In 2003, sixty percent of subscribers in Europe were men. Given that women subscribers increase at the rate of 10 percent per annum and men at the rate of 5 percent per annum, what is the approximate percentage growth of subscribers between 2003 and 2010 in Europe? The subscription prices are volatile and may change each year.

- (1) 62
- (2) 15
- (3) 78
- (4) 84
- (5) 50

Soln: Men subscriber = 60%
 Growth rate = 5% per annum
 Women subscribers = 40%
 Growth rate = 10% per annum
 Overall growth rate = 7% per annum
 Percentage growth from 2003-2010 = 62%
 Hence, answer is option (1).

- 32.** Consider the annual percent change in the gap between subscription revenues in the US and Europe. What is the year in which the absolute value of this change is the highest?
- (1) 03-04
 (2) 05-06
 (3) 06-07
 (4) 08-09
 (5) 09-10

Soln: In 2009, gap is = 110
 In 2008, gap is = 180
 Change = $\frac{70}{180} * 100 \approx 40\%$

Which is highest compared to all other option.
 Hence, answer is option (4).

Directions for Questions 33 to 35:

Answer the following questions based on the information given below. There are 100 employees in an organization across five departments. The following table gives the department-wise distribution of average age, average basic pay and allowances. The gross pay of an employee is the sum of his/her basic pay and allowances.

Department	Number of Employees	Average Age (Years)	Average Basic Pay (Rs.)	Allowances (% of Basic Pay)
HR	5	45	5000	70
Marketing	30	35	6000	80
Finance	20	30	6500	60
Business Development	35	42	7500	75
Maintenance	10	35	5500	50

There are limited numbers of employees considered for transfer/promotion across departments. Whenever a person is transferred/promoted from a department of lower average age to a department of higher average age, he/she will get an additional allowance of 10% of basic pay over and above his/her current allowance. There will not be any change in pay structure if a person is transferred/promoted from a department with higher average age to a department with lower average age.

Questions below are independent of each other.

- 33.** There was a mutual transfer of an employee between Marketing and Finance departments and transfer of one employee from Marketing to HR. As a result, the average age of Finance department increased by one year and that of Marketing department remained the same. What is the new average age of HR department ?

- (1) 30
 (2) 35
 (3) 40
 (4) 45
 (5) cannot be determined

Soln: Mutual transfer between finance & marketing
 Let their ages be X & Y respectively
 Total age of marketing = 30×35
 Before transfer = 1050
 Total age of finance = 600
 Average of finance increase by 1 i.e. 31
 Total age = $31 \times 20 = 620$
 Increase = $620 - 600 = 20$
 i.e. $X - Y = 20$
 Marketing to HR
 Marketing total age = 1050
 X---Leaving M
 Z---Leaving M
 Y---Entering M
 New average of marketing = total age of marketing before transfer - X - Z + Y = 35
 Total age - X - Z + Y = 1015
 $1050 - (X - Y) - Z = 1015$
 $1050 - 20 - Z = 1015$
 $Z = 15$
 Age of person entering HR is 15
 HR total age before transfer is $5 \times 45 = 225$
 So, new total is $225 + 15 = 240$
 So, new average = $240 / 6 = 40$
 Hence, answer is option (3).

- 34.** What is the approximate percentage change in the average gross pay of the HR department due to transfer of a 40-year old person with basic pay of Rs.

8000 from the Marketing department?

- (1) 9%
- (2) 11%
- (3) 13%
- (4) 15%
- (5) 17%

Soln: Basic pay from marketing = 8000

$$= \frac{80}{100} * 8000 = 6400$$

Hence allowance

Addition 10% of basic pay = 10% of 8000

$$= 5000 + \frac{70}{10} \% \text{ of } (5000) = 5000 + 3500 = 8500$$

Gross pay fro HR dept

Total gross pay of HR dept = $8500 * 5 = 42500$

Marketing to HR with gross salary = 15200

Total salary (HR) = $42500 + 15200 = 57700$

$$\text{Average} = \frac{57700}{6} = 9616.6$$

$$\text{Percentage change} = \frac{9616.6 - 8500}{8500} * 100 = \frac{1116.6}{85} \approx 13\%$$

Hence, answer is option (3).

35. If two employees (each with a basic pay of Rs.6000) are transferred from Maintenance department to HR department and one person (with a basic pay of Rs.8000) was transferred from Marketing department to HR department, what will be the percentage change in average basic pay of HR department?

- (1) 10.5%
- (2) 12.5%
- (3) 15%
- (4) 30%
- (5) 40%

Soln: 2 employee's basic salary 6000 each

Move from maintenance to HR & 1 employee with basic pay is 8000 from marketing to HR

Total basic pay of HR = $5 * 5000 = 25000$ initially

which changes to $25000 + 12000 + 8000 = 45000$ after change

Number of person becomes $5+3 = 8$

$$\text{Average} = \frac{45000}{8} = 5625$$

$$\text{Percentage change} = \frac{5625 - 5000}{5000} * 100 = \frac{625}{50} = 12.5\%$$

Hence, answer is option (2).

Directions for Questions 36 to 40:

Answer the following questions based on the information given below:

Abdul, Bikram and Chetan are three professional traders who trade in shares of a company XYZ Ltd. Abdul follows the strategy of buying at the opening of the day at 10 am and selling the whole lot at the close of the day at 3 pm. Bikram follows the strategy of buying at hourly intervals: 10 am, 11 am, 12 noon, 1 pm and 2 pm, and selling the whole lot at the close of the day. Further, he buys an equal number of shares in each purchase. Chetan follows a similar pattern as Bikram but his strategy is somewhat different. Chetan's total investment amount is divided equally among his purchases. The profit or loss made by each investor is the difference between the sale value at the close of the day less the investment in purchase. The "return" for each investor is defined as the ratio of the profit or loss to the investment amount expressed as a percentage.

36. On a "boom" day the share price of XYZ Ltd. keeps rising throughout the day and peaks at the close of the day. Which trader got the minimum return on that day?
- (1) Bikram
 - (2) Chetan
 - (3) Abdul
 - (4) Abdul or Chetan
 - (5) cannot be determined

Soln: Exact amount of investment is not given in the question

Lets assume the prices are as follow.

10 am	11am	12 noon	1pm	2pm	3pm
Rs.10	Rs.11	Rs.12	Rs. 13	Rs.14	Rs.15

Abdul

Now if Abdul's investment = Rs. 500

The No of share = $500/10=50$ shares

Total amt received after share = $50*15=Rs. 750$

Bikram

If Bikram purchases 10 shares every hr.
 Total investment = $(10+11+12+13+14)*10 = 60*10 = 600$
 Amt received after sale = $50*15 = \text{Rs } 750$
 Return = $(750-600)*100/600 = 25\%$

Chetan
 If Chetan Invest Rs 100/hr
 Total investment = Rs.500

$$\text{Total no shares} = \frac{100}{10} + \frac{100}{11} + \frac{100}{12} + \frac{100}{13} + \frac{100}{14}$$

Amount received after sale = $42.25*15 = \text{Rs. } 633.75$

$$\text{Return} = \frac{633.75 - 500}{500} \times 100 = 26.75\%$$

So clearly the minimum return is Bikram's.
 Hence, answer is option (1).

- 37.** On a day of fluctuating market prices, the share price of XYZ Ltd. ends with a gain, i.e., it is higher at the close of the day compared to the opening value. Which trader got the maximum return on that day?
- (1) Bikram
 - (2) Chetan
 - (3) Abdul
 - (4) Bikram or Chetan
 - (5) cannot be determined

Soln: Same as question number 36
 Many cases are possible

I if constant increase is there the Abdul will have maximum return

Since Abdul could be the answer.

II If constant decrease is there and then only at the of the day. Then bikram or chetan would get maximum return

Hence, the answer is option (5)

- 38.** Which one of the following statements is always true?
- (1) Abdul will not be the one with the minimum return
 - (2) Return for Chetan will be higher than that of Bikram
 - (3) Return for Bikram will be higher than that of Chetan

- (4) Return for Chetan cannot be higher than that of Abdul
- (5) none of the above

Soln: Many cases are possible of constant increase is there then Abdul will have maximum return. So first is not always true. Similarly for different possibilities different return are possible. So none of the above statement can be always true
Hence, the answer is option (5)

Information for 39 to 40 :

One day, two other traders, Dane and Emily joined Abdul, Bikram and Chetan for trading in the shares of XYZ Ltd. Dane followed a strategy of buying equal numbers of shares at 10 am, 11 am and 12 noon, and selling the same numbers at 1 pm, 2 pm and 3 pm. Emily, on the other hand, followed the strategy of buying shares using all her money at 10 am and selling all of them at 12 noon and again buying the shares for all the money at 1 pm and again selling all of them at the close of the day at 3 pm. At the close of the day the following was observed:

- i. Abdul lost money in the transactions.
- ii. Both Dane and Emily made profits.
- iii. There was an increase in share price during the closing hour compared to the price at 2 pm.
- iv. Share price at 12 noon was lower than the opening price.

39. Which of the following is necessarily false?

- (1) Share price was at its lowest at 2 pm
- (2) Share price was at its lowest at 11 am
- (3) Share price at 1 pm was higher than the share price at 2 pm
- (4) Share price at 1 pm was higher than the share price at 12 noon
- (5) none of the above

40. Share price was at its highest at

- (1) 10 am
- (2) 11 am

- (3) 12 noon
 (4) 1 pm
 (5) cannot be determined

Solution for 39 and 40:

Let the prices at 10am, 11am, 12pm, 1pm, 2pm & 3pm be X_{10} , X_{11} , X_{12} , X_1 , X_2 , X_3

I. $X_{10} > X_{12}$... (given) ... (1)

$X_3 > X_2$... (given) ... (2)

II. Abdul buys at 10:00 am and sells at 3:00 pm and makes a loss.

Hence, $X_{10} > X_3$... (3)

III. Emily buys at 10:00 am and sells at 12:00 pm. Hence she makes a loss.

To cover up the loss she must make a profit in the second transaction.

Hence, $X_3 > X_1$... (4)

and $X_3 - X_1 > X_{10} - X_{12}$... (5)

IV. Dane buys at 10:00 am, 11:00 am and 12:00 pm and sells at 1:00 pm, 2:00 pm and 3:00pm.

He has an over all profit. Hence total buying value is less than total selling value.

Let number of share bought each time is n .

Then $n X_1 + n X_2 + n X_3 > n X_{10} + n X_{11} + n X_{12}$

$\Rightarrow n (X_1 + X_2 + X_3) > n (X_{10} + X_{11} + X_{12})$

$\Rightarrow (X_1 + X_2 + X_3) > (X_{10} + X_{11} + X_{12})$... (6)

Consider equation (6)

Adding (5) to (6), $2X_3 + X_2 > 2X_{10} + X_{11}$

Hence, $X_2 - X_{11} > 2(X_{10} - X_3)$

But from equation (3), $X_{10} - X_3$ is positive. Hence $X_2 - X_{11}$ is has to be positive.

Hence, $X_2 > X_{11}$... (7)

39: Data Inadequate.

40: From (1), (2), (3), (4) and (7) we get the relations

$X_{10} > X_3 > X_2 > X_{11}$, $X_{10} > X_{12}$ and $X_{10} > X_1$

Therefore share price was highest at 10:00 am.

Hence, the answer is option (1).

Directions for Questions 41 to 43:

Answer the following questions based on the statements given below:

- (i) There are three houses on each side of the road.

- (ii) These six houses are labeled as P, Q, R, S, T and U.
- (iii) The houses are of different colours, namely, Red, Blue, Green, Orange, Yellow and White.
- (iv) The houses are of different heights.
- (v) T, the tallest house, is exactly opposite to the Red coloured house.
- (vi) The shortest house is exactly opposite to the Green coloured house.
- (vii) U, the Orange coloured house, is located between P and S.
- (viii) R, the Yellow coloured house, is exactly opposite to P.
- (ix) Q, the Green coloured house, is exactly opposite to U.
- (x) P, the White coloured house, is taller than R, but shorter than S and Q.

41. What is the colour of the tallest house?

- (1) Red
- (2) Blue
- (3) Green
- (4) Yellow
- (5) none of these

42. What is the colour of the house diagonally opposite to the Yellow coloured house?

- (1) White
- (2) Blue
- (3) Green
- (4) Red
- (5) none of these

43. Which is the second tallest house?

- (1) P
- (2) S
- (3) Q
- (4) R
- (5) cannot be determined

Solution for 41 to 43:

$\frac{P}{White}$	$\frac{U}{Orange}$	$\frac{S}{Red}$
$\frac{R}{Yellow}$	$\frac{Q}{Green}$	$\frac{I}{Blue}$

It is given that U is located between P and S with this we got 1 row arrangement.

$\frac{P}{White} \quad \frac{U}{Orange} \quad \frac{S}{Red}$ Colors of P and U are given directly.

R and Q are opposite to P and Q respectively.

So, only house left is T. Color of R and Q are also given

$\frac{P}{White}$	$\frac{U}{Orange}$	$\frac{S}{-}$
$\frac{R}{Yellow}$	$\frac{Q}{Green}$	$\frac{I}{-}$

Now T is opposite Red color house, so color of S is Red.

Therefore, T will be Blue.

Now, it is given that T is tallest and shortest house is opposite green.

41: Hence Answer Option is (2).

42: Hence Answer Option is (4)

43: Hence Answer Option is (5)

Directions for Questions 44 to 47:

Answer the following questions based on the information given below:

In a sports event, six teams (A, B, C, D, E and F) are competing against each other. Matches are scheduled in two stages. Each team plays three matches in Stage-I and two matches in Stage-II. No team plays against the same team more than once in the event. No ties are permitted in any of the matches. The observations after the completion of Stage-I and Stage-II are as given below.

Stage-I:

- One team won all the three matches.
- Two teams lost all the matches.
- D lost to A but won against C and F.
- E lost to B but won against C and F.
- B lost at least one match.
- F did not play against the top team of Stage-I.

Stage-II:

- The leader of Stage-I lost the next two matches.
- Of the two teams at the bottom after Stage-I, one team won both matches, while the other lost both matches.
- One more team lost both matches in Stage-II.

44. The team(s) with the most wins in the event is (are):

- (1) A
- (2) A & C
- (3) F
- (4) E
- (5) B & E

45. The two teams that defeated the leader of Stage-I are:

- (1) F & D
- (2) E & F
- (3) B & D
- (4) E & D
- (5) F & D

46. The only team(s) that won both the matches in Stage-II is (are):

- (1) B
- (2) E & F
- (3) A, E & F
- (4) B, E & F
- (5) B & F

47. The teams that won exactly two matches in the event are:

- (1) A, B & F
- (2) D & E

- (3) E & F
- (4) D, E & F
- (5) D & F

Soln 44 to 47:

Stage : I :

Possible matches played between teams from the clues are AD, CD, DF, BE, CE and EF As B, C, D, E and F lost at least one match. So, A won all the three games. So, F does not play against A.
=> A played against B,C and D. E played against B,C and F

Win-Loss Table after Stage-I :

Team	A			B			C			D			E			F		
Win(W) Loss(L)	W	W	W	L	W	W	L	L	L	L	W	W	L	W	W	L	L	L
Played Against	B	C	D	A	E	F	A	D	E	A	C	F	B	C	F	B	D	E

Stage : II :

As no two matches are played between the same teams in the sports event and two matches are played by each team, the possible matches are AE, AF, BC, BD, CF and DE.
A lost two matches against E and F.
Bottom most teams of stage-I are C and F. As F won match against A, F will be the team which won all the two matches and C lost both the matches.
D lost both matches

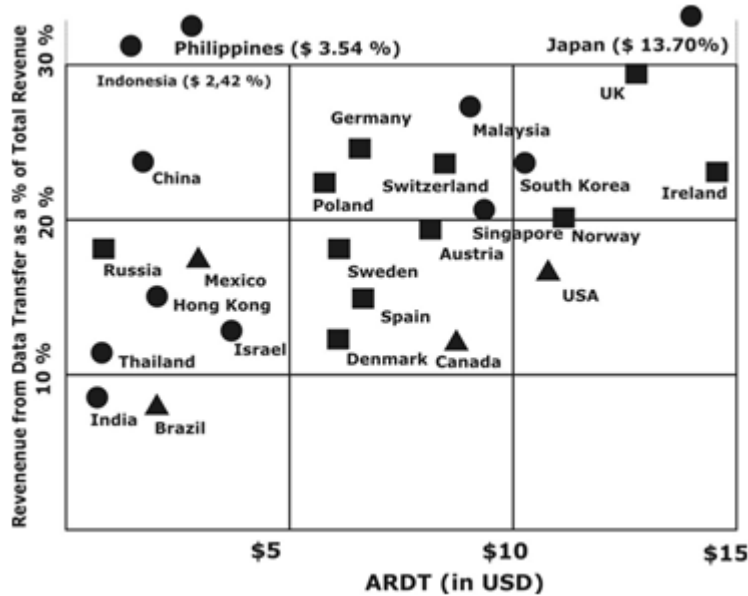
Win-Loss Table after Stage-II :

Team	A		B		C		D		E		F	
Win(W) Loss(L)	L	L	W	W	L	L	L	L	W	W	W	W
Played Against	E	F	C	D	B	F	B	E	A	D	A	C

- 44:** Hence Answer Option is (5).
- 45:** Hence Answer Option is (2).
- 46:** Hence Answer Option is (4).
- 47:** Hence Answer Option is (5).

Directions for Questions 48 to 50:

Answer the following questions based on the information given below: Telecom operators get revenue from transfer of data and voice. Average revenue received from transfer of each unit of data is known as ARDT. In the diagram below, the revenue received from data transfer as percentage of total revenue received and the ARDT in US Dollars (USD) are given for various countries.



Legend: ● ASIA ■ EUROPE ▲ AMERICAS

48. If the total revenue received is the same for the pairs of countries listed in the choices below, choose the pair that has approximately the same volume of data transfer.

- (1) Philippines and Austria
- (2) Canada and Poland
- (3) Germany and USA
- (4) UK and Spain
- (5) Denmark and Mexico

Soln: Considering options

Option	Country	ARDT	% revenue for data trends for	Total volume of data	Revenue from data transfer	Total revenue
(1)	Philippines	\$3	54%	X	3X	$\frac{100X}{18}$
	Australia	\$7	19%	Y	7Y	$\frac{700Y}{19}$
(2)	Canada	\$8	12%	X	8X	$\frac{800X}{12}$
	Poland	\$6	22%	Y	6Y	$\frac{600Y}{22}$
(3)	Germany	\$7	25%	X	7X	$\frac{700X}{25}$
	USA	\$11	16%	Y	11Y	$\frac{1100Y}{16}$
(4)	UK	\$13	29%	X	13X	$\frac{1300X}{29}$
	Spain	\$7	15%	Y	7Y	$\frac{1300X}{29}$
(5)	Denmark	\$6	12%	X	6X	$\frac{600X}{12}$
	Mexico	\$3	18%	Y	3Y	$\frac{300Y}{18}$

Clearly for option 4, we get X and Y to be nearly equal.
Hence, the answer option is (4).

49. It was found that the volume of data transfer in India is the same as that of Singapore. Then which of the following statements is true?
- (1) Total revenue is the same in both countries
 - (2) Total revenue in India is about 2 times that of Singapore
 - (3) Total revenue in India is about 4 times that of Singapore
 - (4) Total revenue in Singapore is about 2 times that of India
 - (5) Total revenue in Singapore is about 4 times that of India

Soln:

	Volume of data transfer	Revenue ARDT (in US \$)	Percentage
India	X	1×X	9%
Singapore	X	9×X	21%

Let total revenue of India and Singapore be TI and Ts respectively.

$$9\% \text{ of } T_1 = X \Rightarrow T_1 = \frac{X \times 100}{9}$$

$$21\% \text{ of } T_5 = 9X \Rightarrow T_5 = \frac{300X}{7}$$

$$T_1 : T_5 = 7 : 27$$

Hence, correct answer is option (5).

50. It is expected that by 2010, revenue from data transfer as a percentage of total revenue will triple for India and double for Sweden. Assume that in 2010, the total revenue in India is twice that of Sweden and that the volume of data transfer is the same in both the countries. What is the percentage increase of ARDT in India if there is no change in ARDT in Sweden?
- (1) 400%
- (2) 550%
- (3) 800%
- (4) 950%
- (5) cannot be determined

Soln:

Country	% revenue of data transfer		ARDT	Total volume of data	Revenue from data transfer	Total revenue
	Percent	2010	2010	2010	2010	2010
Sweden	18%	36%	6	X	6X	$\frac{50X}{3}$
India	9%	27%	9	X	9X	$\frac{100X}{3}$

For Sweden

$$36\% \text{ of total revenue} = 6X$$

$$100\% \text{ of total revenue} = \frac{50X}{3}$$

$$\text{Therefore, For India total revenue} = \text{twice of Sweden's revenue} = \frac{100X}{3}$$

$$= \frac{27}{100 * 3} * 100X = 9X$$

Revenue from data transfer

ARDT for India in 2010 = 9

Therefore, Present ARDT = 1

Therefore, Percentage increase = $\frac{9-1}{1} * 100 = 800\%$
Hence, the answer option is (3).

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