CHAPTER – 8

REASONING – BASED DI

Worked out Examples:

These questions are based on the following information.

The following table shows the number of flights expected to fly between various cities in the month of Jan 2016.

To City / From City	A	B	C	D	E	F	Total
A	–	680	450			240	1,970
B	380	–		480		640	2,430
C	420		–		720		1,840
D		560	280	–			1,960
E	680		440		–	320	
F	320			560		–	
Total	1,860		1,640		1,520	2,420	10,000

At least 10 flights are expected to travel from each city to any other city in Jan 2016.

City to / City from	A	B	C	D	E	F	Total
A	–	680	450	a	b	240	1,970
B	380	–	c	480	d	640	2,430
C	420	E	–	f	720	g	1,840
D	h	560	280	–	i	j	1,960
E	680	k	440	l	–	320	n
F	320	v	p	560	q	–	r
Total	1,860	s	1,640	t	1,520	2,420	10,000

$\Rightarrow$ a + b = 1970 – (680 + 450 + 240) = 600

c + d = 2430 – (380 + 480 + 640) = 930

e + f + g = 1840 – (420 + 720) = 700

h + i + j = 1960 – (560 + 280) = 1,120

k + l = n – (680 + 440 + 320) = n – 1440

v + p + q = r – (320 + 560) = r – 880

h = 1860 – (380 + 420 + 680 + 320) = 60

e + k + v = s – (680 + 560) = s – 1240

c + p = 1640 – (450 + 280 + 440) = 470

a + f + l = t – (480 + 560) = t – 1040

b + d + i + q = 1520 – 720 = 800

g + j + m = 2420 – (240 + 640) = 1,540

n + r = 10,000 – (1970 + 2430 + 1840 + 1960) = 1800

8.01: What is the maximum number of flights expected to fly from city C to city D?
(A) 640   (B) 680   (C) 720   (D) 760

Sol: Maximum number of flights expected to fly from city C to city D
= f_{max} = (700 – e_{min} – g_{min}) = 700 – 10 – 10 = 680.
Choice (B)

8.02: What is the maximum number of flights expected to fly from city B to city E?
(A) 920   (B) 940   (C) 960   (D) 980

Sol: The maximum number of flights expected to fly from city B to city E = d_{max} = 930 – C_{min}
= 930 – 10 = 920   Choice (A)

8.03: What is the minimum number of flights that are expected to land in city D?
(A) 920   (B) 970
(C) 1020   (D) 1070

Sol: The minimum number of flights that are expected to land in city D
= t_{min} = (a_{min}+ 480 + f_{min} + l_{min} + 560)
= 10 + 480 + 10 + 10 + 560 = 1070
Choice (D)

8.04: If it is planned that 320 flights will leave from city E to city C, then what could be the minimum number of flights that would leave from city E?
(A) 1380   (B) 1420
(C) 1460   (D) 1500

Sol: The minimum number of flights that could leave from city E = (680 + 10 + 440 + 320 + 10) = 1460.   Choice (C)

8.05: What could be the ratio of the minimum number of flights that will go to city B to the minimum number of flights that will leave from city F?
(A) 97 : 61   (B) 107 : 71
(C) 117 : 81   (D) 127 : 91

Sol: The minimum number of flights that will go to city B = S_{min} = 680 + 10 + 560 + 10 + 10 = 1270.
Minimum number of flights that will leave from city F = 320 + 10 + 10 + 560 + 10 = 910.
∴ The required ratio = 1270 : 910 = 127 : 91.
Choice (D)

Directions for questions 1 to 5: These questions are based on the information given below.

The table below shows the breakup of the total expenses of company XYZ across seven units – A, B, C, D, E, F and G in the years 2013, 2014, 2015, and 2016.

Unit	2013	2014	2015	2016
A	15%	12%	14%	11%
B	18%	15%	13%	15%
C	11%	11%	10%	18%
D	17%	14%	15%	12%
E	9%	18%	16%	14%
F	16%	13%	18%	14%
G	14%	17%	14%	16%

1. The total expenses of the seven units together increased by 10% from 2013 to 2014. What was the percentage increase in the total expense of units B and E together from 2013 to 2014?

    (A) $26\frac{2}{9}\%$ (B) $30\frac{1}{3}\%$ (C) $34\frac{4}{9}\%$ (D) $38\frac{2}{3}\%$

2. The expenses of unit E increased by 120% from 2013 to 2015. What was the increase in the expenses of unit G from 2013 to 2015?
    (A) 14.5% (B) 17% (C) 20.25% (D) 23.75%

3. From 2013 to 2016 the total expense of the company increased by 40%. Which of the given units showed the highest increase in the expenses in this period?
    (A) C (B) G (C) F (D) E

4. If the expenses of unit G of the company increased by 20% every year, then what was the percentage increase in the expenses of the company from 2013 to 2016?
    (A) 41.8% (B) 46.6% (C) 51.2% (D) 56.8%

5. From 2014 to 2015 there was a 12% increase in the total expenses of the company. How many of the units have shown a decrease in the expense from 2014 to 2015?
    (A) 0 (B) 1 (C) 2 (D) 3

Directions for questions 6 to 10: These questions are based on the information given below.

In a college ABC, 75% of the students like either Cricket or Football. 40% of the students like Cricket of which 75% are boys. 60% of the students like Football, of which 50% are boys. The ratio of the number of boys to girls who like both the games is 8 : 3. Among those who like neither of the games, the ratio of the number of boys to girls is 3 : 8 and the number of girls who like neither of the games is 80.

Directions for questions 6 to 8: Type in your answer in the input box provided below the question.

6. How many girls in the college like Football?

    [ ]

7. How many boys in the college like only one of the two games?

    [ ]

8. What is the total number of girls in the college?

    [ ]

9. What is the ratio of the number of boys to the number of girls who like only cricket?
    (A) 21 : 5 (B) 26 : 7 (C) 1 : 10 (D) 34 : 13

10. What is the number of boys in the college who like at most one of the two games?
    (A) 104 (B) 114 (C) 124 (D) 134

Directions for questions 11 to 15: These questions are based on the information given below.

Three were 240 students in a Business school. Four companies – A, B, C and D offered placement for these students.

The distribution of the students according to the salary offered is as shown below.

Salary offered / Company	≥ ₹5 lakhs	≥ ₹8 lakhs	≥ ₹10 lakhs	≥ ₹12 lakhs
A	212	134	80	32
B	168	120	64	24
C	195	105	45	15
D	175	115	79	25

11. What is the least number of students who were offered a salary of ₹5 lakhs or more by all the four companies?
    (A) 30 (B) 65 (C) 95 (D) 72

12. The number of students who were offered a salary more than or equal to ₹8 lakhs by all the four companies is at most _____.
    (A) 120 (B) 115 (C) 105 (D) 134

13. If no company offered less than ₹5 lakhs to any student, then the number of students who did not get placement is at most _____.
    (A) 72 (B) 45 (C) 30 (D) 28

14. What is the maximum number of students who were offered a salary between ₹8 lakhs and ₹10 lakhs by both companies A and B?
    (A) 56 (B) 54 (C) 64 (D) 80

15. The number of students who were offered a salary between ₹8 lakhs and ₹10 lakhs by company A is the same as the number of students who offered a salary between
    (A) ₹5 lakhs and ₹8 lakhs by company B
    (B) ₹8 lakhs and ₹10 lakhs by company B
    (C) ₹10 lakhs and ₹12 lakhs by company D
    (D) ₹10 lakhs and ₹12 lakhs by company A

A total of eight sports persons, competing in five different sports, had won all of India's medals - seven gold, three silver and three bronze medals, at the Asian games. The following tables give the break-up of medals won by India-sports-wise and person-wise .Assume that each sports person competes in a single sport

Medals Won

Sport	Gold	Silver	Bronze
Chess	1	0	1
Tennis	1	1	0
Athletics	2	0	2
Weight Lifting	2	0	0
Shooting	1	2	0

Medals Won

Athlete	Gold	Silver	Bronze
Anju	1	0	1
Jaspal	0	0	2
Mahesh	1	0	0
Sania	2	0	0
Hari	0	2	0
Neelam	1	0	0
Tania	2	0	0
Selvaraj	0	1	0

16. Which of the following can be the event in which Mahesh won his medal?
(A) Athletics
(B) Weight lifting
(C) Shooting
(D) Chess

17. In which event did Neelam win her medal?
(A) Tennis or Athletics but not Chess
(B) Athletics or Chess
(C) Weight lifting or Tennis but not Athletics
(D) Tennis or Shooting but not Weight lifting

18. How many persons who participated in athletics won medals for India at the games?
(A) 1   (B) 2   (C) 3   (D) 4

19. To which of the following events can three of the eight sports persons, who won the medals, belong?
(A) None   (B) Athletics
(C) Weight lifting   (D) Shooting

20. Who among the following could have won medals for India in Athletics?
(A) Anju   (B) Jaspal   (C) Mahesh   (D) Neelam

Exercise – 8(b)

A cricketer played only four matches. The difference between the number of runs scored by him in the nth match and $(n + 1)^{th}$ match is n. The total number of runs scored by him in all the matches is X.

1. How many different values can X take if the number of runs scored in the first match is 20?
(A) 6   (B) 8   (C) 11   (D) 16

2. If the least possible value of X is 70, then what is the number of runs scored in the first match?
(A) 10   (B) 15   (C) 20   (D) 30

3. If the number of runs scored in the first match is 20, then which of the following cannot be the value of X?
(A) 78   (B) 82   (C) 84   (D) 86

4. If the total number of runs scored in the first three matches is 59, then what is the number of runs scored in the second match?
(A) 18   (B) 19   (C) 20   (D) 21

5. Which of the following cannot be the total number of runs scored in the last three matches?
(A) 56   (B) 58   (C) 60   (D) 62

The distribution of the 31 respondents of a survey based on the number of dependants is as shown. The minimum and maximum age of the respondents is also mentioned. All the respondents are of different ages.

Number of dependants	Number of persons (respondents)	Males	Females	Minimum age	Maximum age
0	2	1	1	34	35
1	3	2	1	28	36
2	12	7	5	19	38
3	8	6	2	32	44
> 3	6	3	3	40	52

6. What is the least number of respondents whose age is less than 50 years?

7. What is the maximum number of women whose age is more than 34 years?

8. Among the persons who have exactly 3 dependants, if the women are of age less than 37 years, then what is the number of men whose age is more than 37 years?

[ ]

9. What is the least number of women whose age is more than 25 but less than 35 years?

[ ]

10. What is the least number of men with at most 2 dependants and with an age less than 30 years?

[ ]

Directions for questions 11 to 15: These questions are based on the information given below.

The following table shows the number of employees in three companies X, Y and Z having accounts in four banks – P, Q, R and S. Each company has a total of 300 employees.

Bank / Company	P	Q	R	S
X	150	180	120	200
Y	120	150	180	140
Z	150	160	120	110

11. What is the maximum number of employees in company Y who can have accounts in all the four banks?
(A) 120   (B) 130   (C) 140   (D) 150

12. What is the minimum number of employees in company X who can have accounts in all the four banks?
(A) 0   (B) 30   (C) 40   (D) 50

13. What is the maximum number of employees in company Z who can have account in only one of the four banks?
(A) 140   (B) 180   (C) 170   (D) 100

14. What could be the ratio of the maximum number of employees in company Y to the minimum number of employees in company Z who have accounts in both the banks P and Q?
(A) 2 : 15   (B) 3 : 16   (C) 4 : 17   (D) 12 : 1

15. What could be the maximum number of employees in the three companies together who do not have any account in the given banks?
(A) 180   (B) 200   (C) 360   (D) 240

Directions for questions 16 to 20: Answer these questions on the basis of the information given below.

The following table gives the number of students who secured more than 90% marks in each of the five subjects – English, Physics, Chemistry, Mathematics and Biology from class 6 to class 10 at a school, in the year 2016.

Subject / Class	English	Physics	Chemistry	Maths	Biology
6	12	16	15	22	18
7	15	22	22	21	15
8	7	18	16	23	17
9	10	19	15	22	18
10	15	25	21	29	16

The table gives the number of students in the different classes in 2016.

Class	Number of Students
6	30
7	35
8	38
9	36
10	40

16. In class 7, the number of students who scored more than 90% in a minimum of two of the five subjects is at least
(A) 12   (B) 15   (C) 18   (D) 20

17. The number of students in class 10 who scored more than 90% in exactly three subjects is at most
(A) 32   (B) 34   (C) 35   (D) 38

18. If a scholarship is awarded to all the students from class 6 to class 10 who score more than 90% in each of the five subjects, then the number of students who won the scholarship is at most
(A) 120   (B) 104   (C) 62   (D) 59

19. The number of students who scored more than 90% in exactly four subjects in all the classes together is at most
(A) 28   (B) 61   (C) 96   (D) 107

20. The number of students in class 6 who scored more than 90% in a maximum of two subjects is at most
(A) 19   (B) 21   (C) 22   (D) 26

Key

Exercise – 8(a)

1. C	5. D	9. B	13. D	17. D
2. D	6. 132	10. D	14. B	18. B
3. A	7. 104	11. A	15. C	19. A
4. C	8. 226	12. C	16. C	20. B

Exercise – 8(b)

1. A	5. C	9. 0	13. B	17. C
2. C	6. 28	10. 5	14. D	18. D
3. D	7. 9	11. A	15. C	19. D
4. C	8. 5	12. A	16. B	20. C