

Quantitative Aptitude

Exercise 1

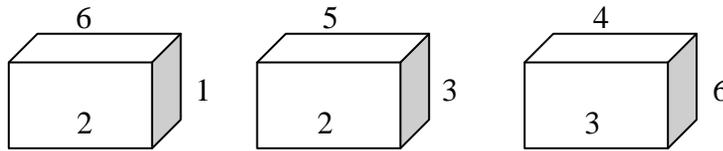
Solve the following and check with the answers given at the end.

1. It was calculated that 75 men could complete a piece of work in 20 days. When work was scheduled to commence, it was found necessary to send 25 men to another project. How much longer will it take to complete the work?
2. A student divided a number by $\frac{2}{3}$ when he required to multiply by $\frac{3}{2}$. Calculate the percentage of error in his result.
3. A dishonest shopkeeper professes to sell pulses at the cost price, but he uses a false weight of 950gm. for a kg. His gain is ...%.
4. A software engineer has the capability of thinking 100 lines of code in five minutes and can type 100 lines of code in 10 minutes. He takes a break for five minutes after every ten minutes. How many lines of codes will he complete typing after an hour?
5. A man was engaged on a job for 30 days on the condition that he would get a wage of Rs. 10 for the day he works, but he have to pay a fine of Rs. 2 for each day of his absence. If he gets Rs. 216 at the end, he was absent for work for ... days.
6. A contractor agreeing to finish a work in 150 days, employed 75 men each working 8 hours daily. After 90 days, only $\frac{2}{7}$ of the work was completed. Increasing the number of men by _____ each working now for 10 hours daily, the work can be completed in time.
7. what is a percent of b divided by b percent of a?
(a) a (b) b (c) 1 (d) 10 (e) 100
8. A man bought a horse and a cart. If he sold the horse at 10 % loss and the cart at 20 % gain, he would not lose anything; but if he sold the horse at 5% loss and the cart at 5% gain, he would lose Rs. 10 in the bargain. The amount paid by him was Rs. _____ for the horse and Rs. _____ for the cart.
9. A tennis marker is trying to put together a team of four players for a tennis tournament out of seven available. males - a, b and c; females – m, n, o and p. All players are of equal ability and there must be at least two males in the team. For a team of four, all players must be able to play with each other under the following restrictions:
b should not play with m,
c should not play with p, and
a should not play with o.

Which of the following statements must be false?

1. b and p cannot be selected together
2. c and o cannot be selected together
3. c and n cannot be selected together.

10-12. The following figure depicts three views of a cube. Based on this, answer questions 10-12.



10. The number on the face opposite to the face carrying 1 is _____.
11. The number on the faces adjacent to the face marked 5 are _____.
12. Which of the following pairs does not correctly give the numbers on the opposite faces.
(1) 6,5 (2) 4,1 (3) 1,3 (4) 4,2
13. Five farmers have 7, 9, 11, 13 & 14 apple trees, respectively in their orchards. Last year, each of them discovered that every tree in their own orchard bore exactly the same number of apples. Further, if the third farmer gives one apple to the first, and the fifth gives three to each of the second and the fourth, they would all have exactly the same number of apples. What were the yields per tree in the orchards of the third and fourth farmers?
14. Five boys were climbing a hill. J was following H. R was just ahead of G. K was between G & H. They were climbing up in a column. Who was the second?
- 15-18 John is undecided which of the four novels to buy. He is considering a spy thriller, a Murder mystery, a Gothic romance and a science fiction novel. The books are written by Rothko, Gorky, Burchfield and Hopper, not necessary in that order, and published by Heron, Piegion, Blueja and sparrow, not necessary in that order.
 - (1) The book by Rothko is published by Sparrow.
 - (2) The Spy thriller is published by Heron.
 - (3) The science fiction novel is by Burchfield and is not published by Blueja.
 - (4)The Gothic romance is by Hopper.
15. Pigeon publishes _____.
16. The novel by Gorky _____.
17. John purchases books by the authors whose names come first and third in alphabetical order. He does not buy the books _____.

18. On the basis of the first paragraph and statement (2), (3) and (4) only, it is possible to deduce that
1. Rothko wrote the murder mystery or the spy thriller
 2. Sparrow published the murder mystery or the spy thriller
 3. The book by Burchfield is published by Sparrow.
19. If a light flashes every 6 seconds, how many times will it flash in $\frac{3}{4}$ of an hour?
20. If point P is on line segment AB, then which of the following is always true?
 (1) $AP = PB$ (2) $AP > PB$ (3) $PB > AP$ (4) $AB > AP$ (5) $AB > AP + PB$
21. All men are vertebrates. Some mammals are vertebrates. Which of the following conclusions drawn from the above statement is correct.
- All men are mammals
 - All mammals are men
 - Some vertebrates are mammals.
 - None
22. Which of the following statements drawn from the given statements are correct?
 Given:
 All watches sold in that shop are of high standard. Some of the HMT watches are sold in that shop.
- a) All watches of high standard were manufactured by HMT.
 - b) Some of the HMT watches are of high standard.
 - c) None of the HMT watches is of high standard.
 - d) Some of the HMT watches of high standard are sold in that shop.
- 23-27.
1. Ashland is north of East Liverpool and west of Coshocton.
 2. Bowling green is north of Ashland and west of Fredericktown.
 3. Dover is south and east of Ashland.
 4. East Liverpool is north of Fredericktown and east of Dover.
 5. Fredericktown is north of Dover and west of Ashland.
 6. Coshocton is south of Fredericktown and west of Dover.
23. Which of the towns mentioned is furthest of the north – west
- (a) Ashland
 - (b) Bowling green
 - (c) Coshocton
 - (d) East Liverpool
 - (e) Fredericktown
24. Which of the following must be both north and east of Fredericktown?
- (a) Ashland
 - (b) Coshocton
 - (c) East Liverpool
- I a only II b only III c only IV a & b V a & c
25. Which of the following towns must be situated both south and west of at least one other town?

- A. Ashland only
 B. Ashland and Fredericktown
 C. Dover and Fredericktown
 D. Dover, Coshocton and Fredericktown
 E. Coshocton, Dover and East Liverpool.
26. Which of the following statements, if true, would make the information in the numbered statements more specific?
 (a) Coshocton is north of Dover.
 (b) East Liverpool is north of Dover
 (c) Ashland is east of Bowling green.
 (d) Coshocton is east of Fredericktown
 (e) Bowling green is north of Fredericktown
27. Which of the numbered statements gives information that can be deduced from one or more of the other statements?
 (A) 1 (B) 2 (C) 3 (D) 4 (E) 6
28. Eight friends Harsha, Fakis, Balaji, Eswar, Dhinesh, Chandra, Geetha, and Ahmed are sitting in a circle facing the center. Balaji is sitting between Geetha and Dhinesh. Harsha is third to the left of Balaji and second to the right of Ahmed. Chandra is sitting between Ahmed and Geetha and Balaji and Eshwar are not sitting opposite to each other. Who is third to the left of Dhinesh?
29. If every alternative letter starting from B of the English alphabet is written in small letter, rest all are written in capital letters, how the month "September" be written.
 (1) SeptEMbEr (2) SEpTeMBEr (3) SeptembeR
 (4) SepteMber (5) None of the above.
30. The length of the side of a square is represented by $x+2$. The length of the side of an equilateral triangle is $2x$. If the square and the equilateral triangle have equal perimeter, then the value of x is _____.
31. It takes Mr. Karthik y hours to complete typing a manuscript. After 2 hours, he was called away. What fractional part of the assignment was left incomplete?
32. Which of the following is larger than $3/5$?
 (1) $1/2$ (2) $39/50$ (3) $7/25$ (4) $3/10$ (5) $59/100$
33. The number that does not have a reciprocal is _____.
34. There are 3 persons Sudhir, Arvind, and Gauri. Sudhir lent cars to Arvind and Gauri as many as they had already. After some time Arvind gave as many cars to Sudhir and Gauri as many as they have. After sometime Gauri did the same thing. At the end of this transaction each one of them had 24. Find the cars each originally had.

35. A man bought a horse and a cart. If he sold the horse at 10 % loss and the cart at 20 % gain, he would not lose anything; but if he sold the horse at 5% loss and the cart at 5% gain, he would lose Rs. 10 in the bargain. The amount paid by him was Rs. _____ for the horse and Rs. _____ for the cart.

Answers:

1. **Answer:**

30 days.

Explanation:

Before:

$$\begin{aligned} \text{One day work} &= 1 / 20 \\ \text{One man's one day work} &= 1 / (20 * 75) \end{aligned}$$

Now:

$$\begin{aligned} \text{No. Of workers} &= 50 \\ \text{One day work} &= 50 * 1 / (20 * 75) \end{aligned}$$

The total no. of days required to complete the work = $(75 * 20) / 50 = 30$

2. **Answer:**

0 %

Explanation:

$$\text{Since } 3x / 2 = x / (2 / 3)$$

3. **Answer:**

5.3 %

Explanation:

He sells 950 grams of pulses and gains 50 grams.

If he sells 100 grams of pulses then he will gain $(50 / 950) * 100 = 5.26$

4. **Answer:**

250 lines of codes

5. **Answer:**

7 days

Explanation:

The equation portraying the given problem is:

$$10 * x - 2 * (30 - x) = 216 \text{ where } x \text{ is the number of working days.}$$

Solving this we get $x = 23$

Number of days he was absent was $7 (30-23)$ days.

6. **Answer:**

150 men.

Explanation:

$$\begin{aligned} \text{One day's work} &= 2 / (7 * 90) \\ \text{One hour's work} &= 2 / (7 * 90 * 8) \end{aligned}$$

One man's work = $2 / (7 * 90 * 8 * 75)$

The remaining work (5/7) has to be completed within 60 days, because the total number of days allotted for the project is 150 days.

So we get the equation

$(2 * 10 * x * 60) / (7 * 90 * 8 * 75) = 5/7$ where x is the number of men working after the 90th day.

We get $x = 225$

Since we have 75 men already, it is enough to add only 150 men.

7. **Answer:**

(c) 1

Explanation:

a percent of b : $(a/100) * b$

b percent of a : $(b/100) * a$

a percent of b divided by b percent of a : $((a / 100) * b) / (b/100) * a) = 1$

8. **Answer:**

Cost price of horse = Rs. 400 & the cost price of cart = 200.

Explanation:-

Let x be the cost price of the horse and y be the cost price of the cart.

In the first sale there is no loss or profit. (i.e.) The loss obtained is equal to the gain.

Therefore $(10/100) * x = (20/100) * y$

$X = 2 * y$ -----(1)

In the second sale, he lost Rs. 10. (i.e.) The loss is greater than the profit by Rs. 10.

Therefore $(5 / 100) * x = (5 / 100) * y + 10$ -----(2)

Substituting (1) in (2) we get

$(10 / 100) * y = (5 / 100) * y + 10$

$(5 / 100) * y = 10$

y = 200

From (1) $2 * 200 = x = 400$

9. **Answer:**

3.

Explanation:

Since inclusion of any male player will reject a female from the team. Since there should be four member in the team and only three males are available, the girl, n should included in the team always irrespective of others selection.

10. **Answer:**

11. **Answer:**
1,2,3 & 4

12. **Answer:**
B

13. **Answer:**
11 & 9 apples per tree.

Explanation:

Let a, b, c, d & e be the total number of apples bored per year in A, B, C, D & E 's orchard. Given that $a + 1 = b + 3 = c - 1 = d + 3 = e - 6$
But the question is to find the number of apples bored per tree in C and D 's orchard. If is enough to consider $c - 1 = d + 3$.

Since the number of trees in C's orchard is 11 and that of D's orchard is 13. Let x and y be the number of apples bored per tree in C & d 's orchard respectively.

Therefore $11x - 1 = 13y + 3$

By trial and error method, we get the value for x and y as 11 and 9

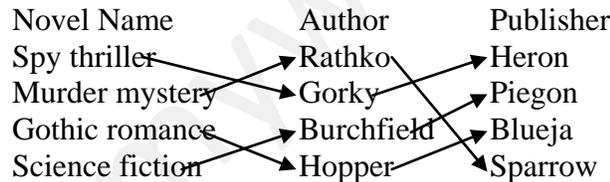
14. **Answer:**
G.

Explanation:

The order in which they are climbing is R - G - K - H - J

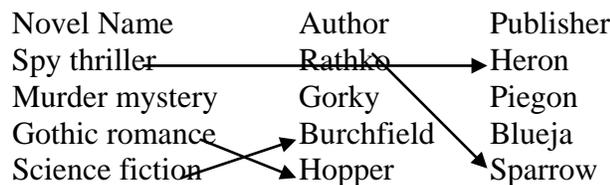
15 - 18

Answer:



Explanation:

Given



Since Blueja doesn't publish the novel by Burchfield and Heron publishes the novel spy thriller, Piegon publishes the novel by Burchfield.

Since Hopper writes Gothic romance and Heron publishes the novel spy thriller, Blueja publishes the novel by Hopper.

Since Heron publishes the novel spy thriller and Heron publishes the novel by Gorky, Gorky writes Spy thriller and Rathko writes Murder mystery.

19. **Answer:**
451 times.

Explanation:

There are 60 minutes in an hour.

In $\frac{3}{4}$ of an hour there are $(60 * \frac{3}{4})$ minutes = 45 minutes.

In $\frac{3}{4}$ of an hour there are $(60 * 45)$ seconds = 2700 seconds.

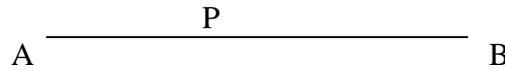
Light flashed for every 6 seconds.

In 2700 seconds $2700/6 = 450$ times.

The count start after the first flash, the light will flashes 451 times in $\frac{3}{4}$ of an hour.

20. **Answer:**
(4)

Explanation:



Since p is a point on the line segment AB, $AB > AP$

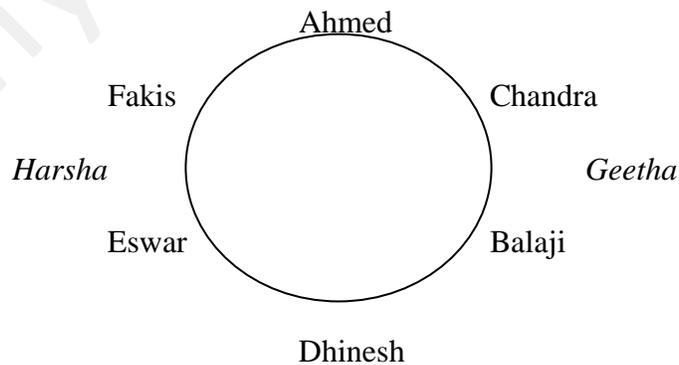
21. **Answer:** (c)

22. **Answer:** (b) & (d).

23 - 27 **Answer:**

28. **Answer:** Fakis

Explanation:



29. **Answer:**
(5).

Explanation:

Since every alternative letter starting from B of the English alphabet is written in small letter, the letters written in small letter are b, d, f...

In the first two answers the letter E is written in both small & capital letters, so they are not the correct answers. But in third and fourth answers the letter is written in small letter instead capital letter, so they are not the answers.

30. **Answer:**

$$x = 4$$

Explanation:

Since the side of the square is $x + 2$, its perimeter = $4(x + 2) = 4x + 8$

Since the side of the equilateral triangle is $2x$, its perimeter = $3 * 2x = 6x$

Also, the perimeters of both are equal.

$$(i.e.) \quad 4x + 8 = 6x$$

$$(i.e.) \quad 2x = 8 \rightarrow x = 4.$$

31. **Answer:**

$$(y - 2) / y.$$

Explanation:

To type a manuscript karthik took y hours.

Therefore his speed in typing = $1/y$.

He was called away after 2 hours of typing.

Therefore the work completed = $1/y * 2$.

Therefore the remaining work to be completed = $1 - 2/y$.

(i.e.) work to be completed = $(y-2)/y$

32. **Answer:**

(2)

33. **Answer:**

1

Explanation:

One is the only number exists without reciprocal because the reciprocal of one is one itself.

34. **Answer:**

Sudhir had 39 cars, Arvind had 21 cars and Gauri had 12 cars.

Explanation:

	Sudhir	Arvind	Gauri
Finally	24	24	24
Before Gauri's transaction	12	12	48
Before Arvind's transaction	6	42	24
Before Sudhir's transaction	39	21	12

35. **Answer:**

Cost price of horse: Rs. 400 &

Cost price of cart: Rs. 200

Explanation:

Let x be the cost of horse & y be the cost of the cart.

10 % of loss in selling horse = 20 % of gain in selling the cart

Therefore $(10 / 100) * x = (20 * 100) * y$

$$\rightarrow x = 2y \text{ -----(1)}$$

5 % of loss in selling the horse is 10 more than the 5 % gain in selling the cart.

Therefore $(5 / 100) * x - 10 = (5 / 100) * y$

$$\rightarrow 5x - 1000 = 5y$$

Substituting (1)

$$10y - 1000 = 5y$$

$$5y = 1000$$

$$y = 200$$

$$x = 400 \quad \text{from (1)}$$

Exercise 2.1

For the following, find the next term in the series

1. 6, 24, 60, 120, 210

- a) 336 b) 366 c) 330 d) 660

Answer : a) 336

Explanation : The series is 1.2.3, 2.3.4, 3.4.5, 4.5.6, 5.6.7, ('.' means product)

2. 1, 5, 13, 25

Answer : 41

Explanation : The series is of the form $0^2+1^2, 1^2+2^2, \dots$

3. 0, 5, 8, 17

Answer : 24

Explanation : $1^2-1, 2^2+1, 3^2-1, 4^2+1, 5^2-1$

4. 1, 8, 9, 64, 25 (Hint : Every successive terms are related)

Answer : 216

Explanation : $1^2, 2^3, 3^2, 4^3, 5^2, 6^3$

5. 8, 24, 12, 36, 18, 54

Answer : 27

6. 71, 76, 69, 74, 67, 72

Answer : 67

7. 5, 9, 16, 29, 54

Answer : 103

Explanation : $5*2-1=9$; $9*2-2=16$; $16*2-3=29$; $29*2-4=54$; $54*2-5=103$

8. 1,2,4,10,16,40,64 (Successive terms are related)

Answer : 200

Explanation : The series is powers of 2 ($2^0, 2^1, \dots$).

All digits are less than 8. Every second number is in octal number system.

128 should follow 64. 128 base 10 = 200 base 8.

Exercise 2.2

Find the odd man out.

1. 3,5,7,12,13,17,19

Answer : 12

Explanation : All but 12 are odd numbers

2. 2,5,10,17,26,37,50,64

Answer : 64

Explanation : $2+3=5$; $5+5=10$; $10+7=17$; $17+9=26$; $26+11=37$; $37+13=50$; $50+15=65$;

3. 105,85,60,30,0,-45,-90

Answer : 0

Explanation : $105-20=85$; $85-25=60$; $60-30=30$; $30-35=-5$; $-5-40=-45$; $-45-45=-90$;

Exercise 3

Solve the following.

1. What is the number of zeros at the end of the product of the numbers from 1 to 100?

Answer : 127

2. A fast typist can type some matter in 2 hours and a slow typist can type the same in 3 hours. If both type combinely, in how much time will they finish?

Answer : 1 hr 12 min

Explanation : The fast typist's work done in 1 hr = $\frac{1}{2}$

The slow typist's work done in 1 hr = $\frac{1}{3}$

If they work combinely, work done in 1 hr = $\frac{1}{2} + \frac{1}{3} = \frac{5}{6}$

So, the work will be completed in $\frac{6}{5}$ hours. i.e., $1 + \frac{1}{5}$ hours = 1hr 12 min

3. Gavaskar's average in his first 50 innings was 50. After the 51st innings, his average was 51. How many runs did he score in his 51st innings. (supposing that he lost his wicket in his 51st innings)

Answer : 101

Explanation : Total score after 50 innings = $50*50 = 2500$

Total score after 51 innings = $51*51 = 2601$

So, runs made in the 51st innings = $2601 - 2500 = 101$

If he had not lost his wicket in his 51st innings, he would have scored an unbeaten 50 in his 51st innings.

4. Out of 80 coins, one is counterfeit. What is the minimum number of weighings needed to find out the counterfeit coin?

Answer : 4

5. What can you conclude from the statement : All green are blue, all blue are red. ?

- (i) some blue are green
 - (ii) some red are green
 - (iii) some green are not red
 - (iv) all red are blue
- (a) i or ii but not both
 - (b) i & ii only
 - (c) iii or iv but not both
 - (d) iii & iv

Answer : (b)

6. A rectangular plate with length 8 inches, breadth 11 inches and thickness 2 inches is available. What is the length of the circular rod with diameter 8 inches and equal to the volume of the rectangular plate?

Answer : 3.5 inches

Explanation : Volume of the circular rod (cylinder) = Volume of the rectangular plate

$$(22/7) \cdot 4 \cdot 4 \cdot h = 8 \cdot 11 \cdot 2$$

$$h = 7/2 = 3.5$$

7. What is the sum of all numbers between 100 and 1000 which are divisible by 14 ?

Answer : 35392

Explanation : The number closest to 100 which is greater than 100 and divisible by 14 is 112, which is the first term of the series which has to be summed.

The number closest to 1000 which is less than 1000 and divisible by 14 is 994, which is the last term of the series.

$$112 + 126 + \dots + 994 = 14(8+9+ \dots + 71) = 35392$$

8. If $s(a)$ denotes square root of a , find the value of $s(12+s(12+s(12+ \dots$ upto infinity.

Answer : 4

Explanation : Let $x = s(12+s(12+s(12+ \dots$

We can write $x = s(12+x)$. i.e., $x^2 = 12 + x$. Solving this quadratic equation, we get $x = -3$ or $x=4$. Sum cannot be -ve and hence sum = 4.

9. A cylindrical container has a radius of eight inches with a height of three inches. Compute how many inches should be added to either the radius or height to give the same increase in volume?

Answer : $16/3$ inches

Explanation : Let x be the amount of increase. The volume will increase by the same amount if the radius increased or the height is increased.

So, the effect on increasing height is equal to the effect on increasing the radius.

$$\text{i.e., } (22/7) * 8 * 8 * (3+x) = (22/7) * (8+x) * (8+x) * 3$$

Solving the quadratic equation we get the $x = 0$ or $16/3$. The possible increase would be by $16/3$ inches.

10. With just six weights and a balance scale, you can weigh any unit number of kgs from 1 to 364. What could be the six weights?

Answer : 1, 3, 9, 27, 81, 243 (All powers of 3)

11. Diophantus passed one sixth of his life in childhood, one twelfth in youth, and one seventh more as a bachelor; five years after his marriage a son was born who died four years before his father at half his final age. How old is Diophantus?

Answer : 84 years

Explanation : $x/6 + x/12 + x/7 + 5 + x/2 + 4 = x$

12. If time at this moment is 9 P.M., what will be the time 2399999992 hours later?

Answer : 1 P.M.

Explanation : 24 billion hours later, it would be 9 P.M. and 8 hours before that it would be 1 P.M.

13. How big will an angle of one and a half degree look through a glass that magnifies things three times?

Answer : 1 1/2 degrees

Explanation : The magnifying glass cannot increase the magnitude of an angle.

14. Divide 45 into four parts such that when 2 is added to the first part, 2 is subtracted from the second part, 2 is multiplied by the third part and the fourth part is divided by two, all result in the same number.

Answer: 8, 12, 5, 20

Explanation: $a + b + c + d = 45$; $a + 2 = b - 2 = 2c = d/2$; $a = b - 4$; $c = (b - 2)/2$; $d = 2(b - 2)$;
 $b - 4 + b + (b - 2)/2 + 2(b - 2) = 45$;

15. I drove 60 km at 30 kmph and then an additional 60 km at 50 kmph. Compute my average speed over my 120 km.

Answer : 37 1/2

Explanation : Time reqd for the first 60 km = 120 min.; Time reqd for the second 60 km = 72 min.; Total time reqd = 192 min

$$\text{Avg speed} = (60 * 120) / 192 = 37 \frac{1}{2}$$

Questions 16 and 17 are based on the following :

Five executives of European Corporation hold a Conference in Rome

Mr. A converses in Spanish & Italian

Mr. B, a Spaniard, knows English also

Mr. C knows English and belongs to Italy
Mr. D converses in French and Spanish
Mr. E , a native of Italy knows French

16. Which of the following can act as interpreter if Mr. C & Mr. D wish to converse
a) only Mr. A b) Only Mr. B c) Mr. A & Mr. B d) Any of the other three

Answer : d) Any of the other three.

Explanation : From the data given, we can infer the following.

- A knows Spanish, Italian
- B knows Spanish, English
- C knows Italian, English
- D knows Spanish, French
- E knows Italian, French

To act as an interpreter between C and D, a person has to know one of the combinations Italian&Spanish, Italian&French, English&Spanish, English&French

A, B, and E know atleast one of the combinations.

17. If a 6th executive is brought in, to be understood by maximum number of original five he should be fluent in

- a) English & French b) Italian & Spanish c) English & French d) French & Italian

Answer : b) Italian & Spanish

Explanation : No of executives who know

- i) English is 2
- ii) Spanish is 3
- iii) Italian is 3
- iv) French is 2

Italian & Spanish are spoken by the maximum no of executives. So, if the 6th executive is fluent in Italian & Spanish, he can communicate with all the original five because everybody knows either Spanish or Italian.

18. What is the sum of the first 25 natural odd numbers?

Answer : 625

Explanation : The sum of the first n natural odd nos is square(n).

$$1+3 = 4 = \text{square}(2) \quad 1+3+5 = 9 = \text{square}(3)$$

19. The sum of any seven consecutive numbers is divisible by

- a) 2 b) 7 c) 3 d) 11

Exercise 3

Try the following.

1. There are seventy clerks working in a company, of which 30 are females. Also, 30 clerks are married; 24 clerks are above 25 years of age; 19 married clerks are above 25 years,

of which 7 are males; 12 males are above 25 years of age; and 15 males are married. How many bachelor girls are there and how many of these are above 25?

2. A man sailed off from the North Pole. After covering 2,000 miles in one direction he turned West, sailed 2,000 miles, turned North and sailed ahead another 2,000 miles till he met his friend. How far was he from the North Pole and in what direction?
3. Here is a series of comments on the ages of three persons J, R, S by themselves.
S : The difference between R's age and mine is three years.
J : R is the youngest.
R : Either I am 24 years old or J 25 or S 26.
J : All are above 24 years of age.
S : I am the eldest if and only if R is not the youngest.
R : S is elder to me.
J : I am the eldest.
R : S is not 27 years old.
S : The sum of my age and J's is two more than twice R's age.
One of the three had been telling a lie throughout whereas others had spoken the truth.
Determine the ages of S,J,R.
4. In a group of five people, what is the probability of finding two persons with the same month of birth?
5. A father and his son go out for a 'walk-and-run' every morning around a track formed by an equilateral triangle. The father's walking speed is 2 mph and his running speed is 5 mph. The son's walking and running speeds are twice that of his father. Both start together from one apex of the triangle, the son going clockwise and the father anti-clockwise. Initially the father runs and the son walks for a certain period of time. Thereafter, as soon as the father starts walking, the son starts running. Both complete the course in 45 minutes. For how long does the father run? Where do the two cross each other?
6. The Director of Medical Services was on his annual visit to the ENT Hospital. While going through the out patients' records he came across the following data for a particular day : " Ear consultations 45; Nose 50; Throat 70; Ear and Nose 30; Nose and Throat 20; Ear and Throat 30; Ear, Nose and Throat 10; Total patients 100." Then he came to the conclusion that the records were bogus. Was he right?
7. Amongst Ram, Sham and Gobind are a doctor, a lawyer and a police officer. They are married to Radha, Gita and Sita (not in order). Each of the wives have a profession. Gobind's wife is an artist. Ram is not married to Gita. The lawyer's wife is a teacher. Radha is married to the police officer. Sita is an expert cook. Who's who?
8. What should come next?
1, 2, 4, 10, 16, 40, 64,

Questions 9-12 are based on the following :

Three adults – Roberto, Sarah and Vicky – will be traveling in a van with five children – Freddy, Hillary, Jonathan, Lupe, and Marta. The van has a driver's seat and one passenger seat in the front, and two benches behind the front seats, one bench behind the other. Each bench has room for exactly three people. Everyone must sit in a seat or on a bench, and seating is subject to the following restrictions: An adult must sit on each bench.

Either Roberto or Sarah must sit in the driver's seat.

Jonathan must sit immediately beside Marta.

9. Of the following, who can sit in the front passenger seat ?
(a) Jonathan (b) Lupe (c) Roberto (d) Sarah (e) Vicky
10. Which of the following groups of three can sit together on a bench?
(a) Freddy, Jonathan and Marta (b) Freddy, Jonathan and Vicky
(c) Freddy, Sarah and Vicky (d) Hillary, Lupe and Sarah
(e) Lupe, Marta and Roberto
11. If Freddy sits immediately beside Vicky, which of the following cannot be true ?
 - a. Jonathan sits immediately beside Sarah
 - b. Lupe sits immediately beside Vicky
 - c. Hillary sits in the front passenger seat
 - d. Freddy sits on the same bench as Hillary
 - e. Hillary sits on the same bench as Roberto
12. If Sarah sits on a bench that is behind where Jonathan is sitting, which of the following must be true ?
 - a. Hillary sits in a seat or on a bench that is in front of where Marta is sitting
 - b. Lupe sits in a seat or on a bench that is in front of where Freddy is sitting
 - c. Freddy sits on the same bench as Hillary
 - d. Lupe sits on the same bench as Sarah
 - e. Marta sits on the same bench as Vicky
13. Make six squares of the same size using twelve match-sticks. (Hint : You will need an adhesive to arrange the required figure)
14. A farmer has two rectangular fields. The larger field has twice the length and 4 times the width of the smaller field. If the smaller field has area K , then the area of the larger field is greater than the area of the smaller field by what amount?
(a) $6K$ (b) $8K$ (c) $12K$ (d) $7K$
15. Nine equal circles are enclosed in a square whose area is 36sq units . Find the area of each circle.
16. There are 9 cards. Arrange them in a 3×3 matrix. Cards are of 4 colors. They are red, yellow, blue, green. Conditions for arrangement: one red card must be in first row or

second row. 2 green cards should be in 3rd column. Yellow cards must be in the 3 corners only. Two blue cards must be in the 2nd row. At least one green card in each row.

17. Is z less than w ? z and w are real numbers.

(I) $z^2 = 25$

(II) $w = 9$

To answer the question,

a) Either I or II is sufficient

b) Both I and II are sufficient but neither of them is alone sufficient

c) I & II are sufficient

d) Both are not sufficient

18. A speaks truth 70% of the time; B speaks truth 80% of the time. What is the probability that both are contradicting each other?

19. In a family 7 children don't eat spinach, 6 don't eat carrot, 5 don't eat beans, 4 don't eat spinach & carrots, 3 don't eat carrot & beans, 2 don't eat beans & spinach. One doesn't eat all 3. Find the no. of children.

20. Anna, Bena, Catherina and Diana are at their monthly business meeting. Their occupations are author, biologist, chemist and doctor, but not necessarily in that order. Diana just told the neighbour, who is a biologist that Catherina was on her way with doughnuts. Anna is sitting across from the doctor and next to the chemist. The doctor was thinking that Bena was a good name for parent's to choose, but didn't say anything. What is each person's occupation?