



MATHS

BOOKS - ARIHANT SSC MATHS (HINGLISH)

PERMUTATIONS AND COMBINATIONS

Example

1. How many numbers of four digits can be formed with the digits 1, 2, 3, 4 and 5?

(Repetition of digits is not allowed.)



2. How many numbers between 400 and 1000 can be made with the digits 2,3, 4, 5, 6 and 0? (Repetition of digits is not allowed.)

Watch Video Solution

3. In how many ways, can the letters of the word 'DIRECTOR' be arranged, so that the





5. In how many ways, 3 books can be given away to 7 boys, when each boy is eligible for any of the books?



6. A gentleman has 6 friends to invite. In how many ways, can he send invitation cards to them, if he has three servants to carry the cards?

Watch Video Solution

7. If ${}^{n}P_{4} = 360$, find the value of n_{\cdot}

8. If ${}^{10}P_r$ = 720, find r.

A. a) 2

B. b) 3

C. c) 5

D. d) 4

Answer: 3

9. In how many ways can 5 members form a committee out of 10 be selected so that
(i) two particular members must be included.
(ii) two particular members must not be included.

Watch Video Solution

10. A question paper has two parts, part A and part B, each containing 10 questions. If the student has to choose 8 from part A and 5

from part B, in how many ways can he choose

the question?



12. Find the number of ways, in which 7 books can be selected out of 10 books available.



13. A hall has 12 gates. In how many ways, can a

man enter the hall through one gate and

come out through a different gate?



14. There are three stations A, B and C and five routes for going from station A to B and four routes from station B to C. Find the number of

different ways through which a person can go

from A to C via B.



15. There are 25 students in a class with 15 boys and 10 girls. The class teacher selects either a boy or a girl for monitor post of the class. In how many ways, the class teacher can make this selection?



16. If
$${}^{15}C_{3r}$$
= ${}^{15}C_{r+3}$, find r.



18. Find the total number of ways, in which 10

beads can be strung into a necklace?





19. In a cricket tournament 5 matchs were played, then in how many ways result can be declared?

Watch Video Solution

20. In a party, every person shakes his hand with every other person only once. If total number of handshakes is 210, then find the number of persons.



22. In a plane, there are 11 points, out of which 5 are collinear. Find the number of triangles

made by these points.

Exercise Base Level Questions

1. Find the value of 5P_2 .

A. 15

B. 18

C. 20

D. 122

Answer: C



2. If ${}^{n}P_{3}$ = 9240 , then find the value of n.

A. 20

B. 21

C. 22

D. 23

Answer: C

3. If ${}^{50}C_r = {}^{50}C_{r+2}$,find r.

A. 24

- B. 23
- C. 22
- D. 21

Answer: A



4. If $(1 \times 2 \times 3 \times 4 \times ... \times n!)$ = n, then (14!

- 13! - 12!) is equal to

A. 14 imes 12 imes (12!)

 $\mathsf{B.}\,14\times12\times(13!)$

 $\mathsf{C.}\,14\times13\times(13!)$

D. 13 imes 12 imes (12!)

Answer: A

5. In how many different ways, can the letters

of the word 'INHALE' be arranged?

A. 720

B. 360

C. 120

D. 650

Answer: A

6. In how many ways, the letters of the word

'ARMOUR' can be arranged?

A. 720

B. 300

C. 640

D. None of the above

Answer: D

7. In how many ways, the letters of the word

'BANKING' can be arranged?

A. 5040

B. 2540

C. 5080

D. 2520

Answer: D

8. In how many ways, the letters of the word

'STRESS' can be arranged?

A. 360

B. 240

C. 720

D. 120

Answer: D

9. In how many different ways, the letters of

word 'FINANCE' can be arranged?

A. 5040

B. 2040

C. 2510

D. None of the above

Answer: D

10. In how many different ways, can the letters

of the word VENTURE' be arranged?

A. 840

B. 5040

C. 1260

D. 2520

Answer: D

11. How many different signals, can be made by

5 flags from 8 flags of different colours?

A. (1) 6270

- B. (2) 1680
- C. (3) 20160
- D. (4) 6720

Answer: D

12. A child has four pockets and three marbles. In how many ways, the child can put the marbles in the pockets?

A. (1) 12

B. (2) 64

C. (3) 256

D. (4) 60

Answer: B

13. In how many ways, can the letters of the word 'ASSASSINATION' be arranged, so that all the S are together?

A. 10!

B. 14!/(4!)

C. 151200

D. 3628800

Answer: C

14. There is a 7-digit telephone number with all different digits. If the digit at extreme right and extreme left are 5 and 6 respectively, find how many such telephone numbers are possible?

A. 120

B. 100000

C. 6720

D. 30240

Answer: C



15. In a meeting between two countries, each country has 12 delegates. All the delegates of one country shake hands with all delegates of the other country. Find the number of handshakes possible.

A. 72

B. 144

D. 234

Answer: B

Watch Video Solution

16. Find the number of ways, in which 12 different beads can be arranged to form a necklace.

A.
$$\frac{11!}{2}$$

B. $\frac{10!}{2}$

$\mathsf{C}.\,\frac{12!}{2}$

D. Couldn't be determined

Answer: A



17. 20 persons were invited to a party. In how

many ways, they and the host can be seated at

a circular table?

B. 19!

C. 20!

D. Couldn't be determined

Answer: C

Watch Video Solution

18. In how many ways, can 24 persons be seated around a circular table, if there are 13 seats?

A. a)
$$\frac{24!}{13 \times 11!}$$

B. b) $\frac{22!}{14 \times 12!}$
C. c) $\frac{23!}{13 \times 11!}$
D. d) $\frac{24!}{12 \times 12!}$

Answer: A



19. In how many different ways, 5 boys and 5 girls can sit on a circular table, so that the boys and girls are alternate?

A. 2880

B. 2800

C. 2680

D. 2280

Answer: A

Watch Video Solution

20. How many necklaces of 12 beads can be

made from 18 beads of various colours?

A.
$$\frac{118 \times 13!}{2}$$

B. $\frac{110 \times 14!}{2}$
C. $\frac{119 \times 13!}{2}$
D. $\frac{110 \times 12!}{2}$

Answer: C



21. A committee of 5 members is going to be formed from 3 trainees, 4 professors and 6 research associates. How many ways can they

be selected, if in committee, there are 2

trainees and 3 research associates?

A. a)15

B.b)45

C. c)60

D. d)9

Answer: C



22. A committee of 5 members is going to be formed from 3 trainees, 4 professors and 6 research associates. How many ways can they be selected, if there are 4 professors and 1 research associate or 3 trainees and 2 professors?

A. 12

B. 13

C. 24





23. In how many ways, a committee of 3 men and 2 women can be formed out of a total of 4 men and 4 women?

A. 15

B. 16

C. 20

Answer: D



24. In how many ways can a cricket team of 11players be chosen out of a batch of 15 players?A particular player is always chosen.

A. 1835

B. 1001

C. 1635

Answer: B



25. In how many ways, a cricket team of 11 players can be made from 15 players, if a particular player is never chosen?

A. 364

B. 480

C. 1365





26. How many straight lines can be drawn from

15 non-collinear points?

A. 105

B. 120

C. 110





27. There is a polygon of 12 sides. How many triangles can be drawn using the vertices of polygon?

A. 200

B. 220

C. 240

Answer: B



28. There are 14 points in a plane, out of which 4 are collinear. Find the number of triangles made by these points.

A. 364

B. 360

C. 368

Answer: B



29. There are 10 points in a plane, out of which 5 are collinear. Find the number of straight lines formed by joining them.

A. 36

B.45

C. 30





30. Find the number of diagonals formed in hexagon.

A. 12

B. 10

C. 6





Higher Skill Level Questions

1. If
$${}^{56}P_{r+6}$$
: ${}^{54}P_{r+3}$ = 30800, find ${}^{r}P_{2}$.

A. 1840

B. 2640

C. 1640

D. 820

Answer: C

Watch Video Solution

2. A can do a piece of work in 10 days and B can do the same work in 12 days. How long will they take to finish the work, if both work together?

A. a.12/11

B. b.27/11

C. c.60/11

D. d.47/11

Answer: A

Watch Video Solution

3. Find the number of permutations that can be made from the letters of the word 'OMEGA'.E being always in the middle.

A. a. 18 ways

B. b. 24 ways

C. c. 48 ways

D. d. 20 ways

Answer: B

Watch Video Solution

4. Find the number of permutations that can be made from the letters of the word 'OMEGA'. Vowels occupying odd places .

A. a. 12 ways

B. b. 16 ways

C. c. 6 ways

D. d. 20 ways

Answer: A

Watch Video Solution

5. What is 40% of 50% of 3/4th of 3200?

A. a. 480

B. b. 560

C. c. 420

D. d. 600

Answer: B

Watch Video Solution

6. A question paper consists of two sections having respectively 3 and 5 questions. The following note is given on the paper. "It is not necessary to attempt all the questions". One

question from each section is compulsory. In how many ways, a candidate can select the question?

A. 38

B. 217

C. 256

D. 320

Answer: B

7. Find the number of combinations that can be formed with 5 oranges, 4 mangoes and 3 bananas, when one fruit of each kind is taken.

A. 60

B. 120

C. 110

D. 75

Answer: A



8. In how many ways, 12 balls can be divided between 2 boys, one receiving 5 and the other 7 balls?

A. 1784

B. 1584

C. 1854

D. 1560

Answer: B

9. There are 10 stations on a railway line. The number of different journey tickets that are required by the authorities, is

A. 92

B. 90

C. 91

D. 93

Answer: B



10. The number of ways in which a committee of 3 ladies and 4 gentlemen can be appointed from a group consisting of 8 ladies and 7 gentlemen, if Mrs. X refuses to serve in a committee if Mr. Yis its member, is

A. 1960

B. 3240

C. 1540

D. None of the above

Answer: D



11. There are 10 questions in a question paper. In how many ways, a student can solve these questions, if he solves one or more questions?

A. 1024

B. 1025

C. 1023

D. 1000

Answer: C



12. In how many ways, can 15 people be seated around two round tables with seating capacities of 7 and 8 people?

A. 15!/(8!)

B. 71/88!

C. $^{15}C_8 imes 6! imes 7!$

D. ${}^{15}C_8 * 8!$

Answer: C



13. A five digits number divisible by 3 is to be formed using the number 0,1,2,3,4 and 5 without repetition. The number of such numbers are m^3 then m is equal to

A. 122

B. 210

C. 216

Answer: C



14. The figure below shows the network connecting cities A, B, C, D, E and F. The arrows indicate permissible direction of travel. What is the number of distinct Daths from A to F!



A. 9

B. 10

C. 11

D. None of the above

Answer: D

Watch Video Solution

15. In the given figure, the lines represent one way roads allowing travel only northwards or only westwards. Along how many distinct

routes can a car reach point B from point A?



A. 15

- B. 56
- C. 120
- D. 336

Answer: B



16. A new flag is to be designed with six vertical stripes using some or all of the colour yellow, green, blue and red. Then, the number of ways this can be made such that no two adjacent stripes have the same colour is

A. 12 imes 81

 $\text{B.}\,16\times192$

 $\mathrm{C.}\,20\times125$

D. 24 imes216

Answer: A



17. An intelligence agency forms a code of two distinct digits selected from 0, 1, 2, ..., 9 such that the firstdigit of code is non-zero. The code, handwritten on a slip, can however potentially create confusion when read upside down, for examples the code 91 may appear as 16. How many codes are there for which no such confusion can arise?

A. 80

B. 78

C. 71

D. 69

Answer: D



18. How many numbers can be formed from 1,

2, 3, 4, 5 (without repetition), when the digit at

the unit's place must be greater than that in

the ten's place?

A. 54 B. 60 C. $\frac{5!}{3}$

D.
$$2 imes 4!$$

Answer: B



19. Boxes numbered 1, 2, 3, 4 and 5 are kept in a row and they are to be filled with either a red or a blue ball, such that no two adjacent boxes can be filled with blue balls. Then, how many different arrangements are possible, given that all balls of a given colour are exactly identical in all respects?

A. 8

B. 10

C. 15

D. 22

Answer: D