



# MATHS

## BOOKS - UNITED BOOK HOUSE

### Hare School, Question Paper

#### Exercise

1. In how many different ways can 5 boys and 10 girls sit in a row on 15 seats, so that no two boys may sit side by side?





[Watch Video Solution](#)

2. The Indian cricket eleven is to be selected out of 15 players. 6 of them bowlers and 9 of them batsman. In how many ways the team can be selected so that the team contains at least 3 bowlers.



[Watch Video Solution](#)

3. Show that, if  $n$  be any positive integer greater than 1, then  $(2^{3n} - 7n - 1)$  is divisible by 49.



[Watch Video Solution](#)

 Watch Video Solution

4. If  $x = \log_{2a}^a$ ,  $y = \log_{3a}^{2a}$  and  $z = \log_{4a}^{3a}$  show that  $xyz = 2yz - 1$ .



Watch Video Solution

5. If  $x = \log_a^{bc}$ ,  $y = \log_b^{ca}$  and  $z = \log_c^{ab}$  then show that  $\frac{1}{x+1} + \frac{1}{y+1} + \frac{1}{z+1} = 1$ ,  $[abc \neq 1]$



Watch Video Solution

6. If none of the figures, 3, 4, 5, 6, 7 be repeated, how many different numbers of 4 digists ( $> 5000$ ) can be formed with them?



[Watch Video Solution](#)

7. State and prove that Cauchy-Schwarz inequality.



[Watch Video Solution](#)

8. If  $a, b, c$  be three unequal sides of a triangle

show

that

$$\frac{1}{b+c-a} + \frac{1}{c+a-b} + \frac{1}{a+b-c} > \frac{9}{a+b+c}$$



Watch Video Solution

9. If  $n$  be a positive integer greater than 1, prove

that  $\left(\frac{n+1}{2}\right)^n > n$



Watch Video Solution

10. If  $a, b, c$  are positive numbers satisfying  $4ab + 6bc + 8ca = 9$  find the greatest value of  $(abc)$ .



[Watch Video Solution](#)

11. Distinguish between attribute and variable.



[Watch Video Solution](#)

12. Find the arithmetic mean and median for first  $n$  natural numbers.



[Watch Video Solution](#)

13. Find the AM of 5, 55, 555,.....upto n times.



[Watch Video Solution](#)

14. If  $P(A) = 1/2$ ,  $P(B) = 2/3$  then prove that

$$\frac{1}{6} \leq P(A \cap B) \leq \frac{1}{2}$$



[Watch Video Solution](#)

15. If 9 biscuits of different types be distributed among 3 children, find the probability that particular child will get 4 biscuits.



[Watch Video Solution](#)

16. Show that  $\sum_{i=1}^n (x_i - A)^2$  is minimum when  $A = \bar{x}$ .



[Watch Video Solution](#)



17. If  $y = \frac{x - a}{b}$ , then prove that  $Sy = \frac{Sx}{|b|}$



Watch Video Solution

18. Prove that

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$



Watch Video Solution

19. The variance of 1, 2,.....n is 24. Find n.



Watch Video Solution

20. For 10 values of X, it is given that  $\sum u = 4$   
and  $\sum u^2 = 144$ , where  $u = \frac{x - 10}{5}$ , find  
 $\sum x^2$



[Watch Video Solution](#)

21. Two groups of 15 and 22 values have variances  
9 and 16 respectively. If the group means differ by  
8.2, then find the standard deviation of the  
combined group of values.



[Watch Video Solution](#)

22. For a set of  $n$  positive quantities prove that

$$AM \geq GM \geq HM.$$



Watch Video Solution

23. Prove that  $\frac{1}{n} \sum_{E_1}^n |x_i - A|$  attains, minimum

when  $A = \text{Median}$ .



Watch Video Solution

24. Let  $x$  be a variable assuming the values 1,

2,..... $k$  and let  $F_1 = n, F_2, \dots, F_k$  be the

corresponding cumulative frequencies of the

greater than type show that  $\bar{x} = \frac{1}{n} \sum_{i=1}^k F_i$ .



**Watch Video Solution**

25.  $|x - 2| \leq 6$  implies that

A.  $(- ) 3 \leq x \leq 7$

B.  $3 \leq x \leq 5$

C.  $(- ) 7 \leq x \leq 7$

D. none of these

**Answer:**



Watch Video Solution

26. When it comes to comparing different segments among themselves and also their relation to the whole we use

- A. pie chart
- B. divided bar chart
- C. either a or b
- D. none of these

**Answer:**



[Watch Video Solution](#)

27. Mode of a distribution can be obtained from

- A. Frequency polygon
- B. Histogram
- C. ogives
- D. none of these

**Answer:**



[Watch Video Solution](#)

**28.** Frequency curve is the limiting form of

A. a frequency polygon

B. a histogram

C. either a or b

D. none of these

**Answer:**



**Watch Video Solution**

**29.** If the AM and HM of two numbers are 16 and 4 respectively, then the GM would be

A. 10

B. 8

C. 9

D. none of these

**Answer:**



**Watch Video Solution**

**30.** If the median and mode for a moderate asymmetrical distribution are 8 and 5 respectively, then the value of mean is



A. 6.5

B. 10

C. 9.5

D. none of these

**Answer:**



**Watch Video Solution**

**31.** If  $2x + 3y = 6$  and S.D. of  $X = 6$ , the S.D. of  $y$  is -

A. (-)4

B. 4

C. 9

D. none of these

**Answer:**



**Watch Video Solution**

**32.** If the C.V. is 40 and  $SX^2 = 400$ , then  $\bar{x}$  is

A. 50

B. 1.25

C. 100

D. none of these

**Answer:**



**Watch Video Solution**

**33.** If  $3x - 2y + 6 = 0$ ,  $R(x) = 4$ , then  $R(y)$  is

A. 6

B. 4

C. 8

D. none of these

**Answer:**



**Watch Video Solution**