

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?



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.



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



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



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

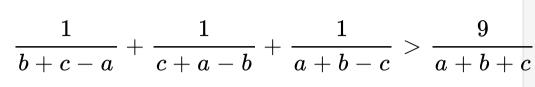


6. If none of the figures, 3, 4, 5, 6, 7 be repeated, how many different numbers of 4 digists (> 5000) can be formed with them?



7. State and prove that Cauchy-Schwarz inequality.







9. If n be a positive integer greater than 1, prove that
$$\left(\frac{n+1}{2}\right)^n>n$$



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



11. Distinguish between attribute and variable.



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



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



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

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



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



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

$$A=\bar{x}.$$



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



18. Prove that

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



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



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



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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.



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22. For a set of an positive quantities prove that AM > GM > HM.



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



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

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

corresponding cumulative frequencies of the greater than type show that $ar{x} = rac{1}{n} \sum_{i=1}^k F_i$.



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

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

B.
$$3 \leq x \leq 5$$

$$\mathsf{C.}\,(\,-\,)7 \leq x \leq 7$$

D. none of these

Answer:

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:

27. Mode of a distribution can be obtained from

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

Answer:



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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:



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:



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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:



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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:



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

A. 50

B. 1.25

C. 100

D. none of these

Answer:



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

A. 6

B. 4

C. 8

D. none of these

Answer:



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