



## MATHS

### BOOKS - UNITED BOOK HOUSE

#### Model Test Set - 4

#### Exercise

1. 10 is the mean of a set of 7 observations and 5 is the mean of a set of 3 observations. The mean of a combined set is given by

A. 15

B. 10

C. 8.5

D. 7.5

**Answer:**



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**2.** In a symmetric distribution, the mean and the mode are

A. not equal

B. equal

C. greater

D. None of these.

**Answer:**



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3. In Newton's forward interpolation formula the values of the argument are \_\_\_\_\_.

A. Equispaced

B. Not Equispaced

C.

D.

**Answer:**



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4. If  $f(x) = x^2$ , then  $\Delta^2 f(x)$  is

A.  $2h^2$

B. 3

C. 1

D. 4

**Answer:**



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5. The no. of single digit Fermat numbers is

A. 2

B. 3

C. 1

D. 4

**Answer:**



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6.  $a \equiv b \pmod{n}$  and  $b \equiv a \pmod{n}$  are equivalent

A. 1

B.

C.

D.

**Answer:**



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7. If  $A_1, A_2, A_3$ , are equally likely, exhaustive and mutually exclusive then  $P(A_1)$  equals

A. 1

B. 0

C.  $\frac{1}{2}$

D.  $\frac{1}{3}$

**Answer:**



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**8.** If event A is contained in event B,  $P(A \text{ or } B) = P(B)$ .

A. 1

B.

C.

D.

**Answer:**

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9. For a positively skewed distribution, what is the relation between mean, median and mode?

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10. Give an example of ordinal data.

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11. What is the relation of median, of a distribution with its quartiles?

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12. The variance of 1st n natural number is 24. Find n.

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13. For two independent events A and B with  $P(A)=0.5$ ,  $P(B^C) = 0.3$ , find the probability of exactly one of

them will occur.



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**14.** Give the expression not more than two events occur' for two arbitrary events A and B.



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**15.** What is Random experiment?



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16. Draw venn diagram to represent the following set :

$$(A \cup B) - C.$$



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17. Draw venn-diagram to represent the following set

$$(A \cap B) - C.$$



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18. Write down the Fisher's Price index formula.



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19. What do you mean by wholesale price index number ?

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20. With reason write that whether the following statements is consistent or not  $n=10$ ,  $me(x)=5$ ,

$$\sum_{i=1}^{10} x_i = 40, \sum_{i=1}^{10} |x_i - 5| = 25, \sum_{i=1}^{10} |x_i - 4| = 27.$$

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21. In a moderately skew distribution A.M. = 24.6 and the median = 26.1. Find the value of the mode.



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**22.** The mean, median and the coefficient of variation of a distribution are respectively 45, 42 and 40%. Find the standard deviation, mode and coefficient of skewness.



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**23.** For any two events  $A_1$  and  $A_2$ , show that  $P(A_1 \cap A_2) \leq \min \{P(A_1), P(A_2)\}$  where  $\min \{P(A_1), P(A_2)\}$  is the minimum of  $P(A_1)$  and  $P(A_2)$ .

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24. Show that if events A and B are independent, then so are  $A^c$  and  $B^c$ .

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25. In a group of 20 males and 5 females, 10 males and 3 females are service holders, What is the probability that a person selected at random from the group, is a service holder, given that the selected person is a male?

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**26.** The first two moments of a distribution about the value 5 are 3 and 25 respectively. If the mode is 6 obtain Pearson's coefficients of skewness and coefficient of variation.

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**27.** What are the principal characteristics of an ideal average?

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**28.** If A.M and G.M of two positive real numbers are 25 and 15 respectively, then find their H.M.

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**29.** Find the condition that the equation  $x^3 + bx^2 + cx + d = 0$  may have two roots equal but of opposite sign.

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**30.** If  $f(x) = 6x^3 + 4x^2 + 3x + 2$ , find the values of  $f(-1)$ ,  $f\left(\frac{1}{3}\right)$  and  $f(\sqrt{2})$ .





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31. Prove that  $\log_n(n + 1) > \log_{n+1}(n + 2)$ , for  $n > 1$ .



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32. Write the axiomatic definition of probability?



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33. A picnic is arranged to be held on a particular day.

The weather forecast says that there is 80% chance of rain on that day. If it rains, the probability of a good

picnic is 0.3, and if it does not, the probability is 0.9.

What is the probability that the picnic will be good ?



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**34.** State and prove the theorem of compound probability.



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**35.** What do you mean by purchasing power of money?



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**36.** What do you mean by diagrammatic representation of data. Also write its merits and demerits.



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**37.** Write a short note on measures of central tendency.



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**38.** The first three moments of a distribution about the value 3 of a variable are 2, 10 and 30 respectively.

Obtain the first three moments about zero.



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**39.** Three boxes of the same appearance have the following proportions of black and white balls : Box I-5 black and 3 white, Box II-6 black and 2 white: BoxIII-3 black and 5 white, one of the boxes is selected at random and one ball is drawn randomly from it. What is the probability that the ball is black?



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**40.** Three boxes of the same appearance have the following proportions of black and white balls : Box I-5 black and 3 white, Box II-6 black and 2 white: BoxIII-3 black and 5 white, one of the boxes is selected at random and one ball is drawn randomly from it. Given that the ball is black, find the probability that it came from Box III.



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**41.** For any two events A and B, show that  $\max \{P(A), P(B)\} \leq P(A \cup B) \leq \min \{P(A) + P(B), 1\}$   
Where  $A \cup B, A \cap B, \max \{P(A), P(B)\}$  and

$\min \{P(A) + P(B), 1\}$  are the occurrence of A and B, occurrence of A and B both, maximum of P(A) and P(B): minimum of P(A) + P(B) and 1 respectively.



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42. What is Life table?



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