



# MATHS

## BOOKS - UNITED BOOK HOUSE

### Model Test Set - 1

#### Exercise

1. For any frequency distribution

A.  $b_2 > b_1$

B.  $b_2 > b_1$

C.  $b_2 = b_1$

D.  $b_2 \geq b_1$ .

**Answer:**



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2. A train ran at  $x \text{ km / hour}$  from A to B and returned from B to A at  $y \text{ km / hour}$ . The average speed (in  $\text{km / hour}$ ) is

A.  $\frac{x + y}{2}$

B.  $\sqrt{xy}$

C.  $\frac{2xy}{x + y}$

D. none of these.

**Answer:**



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**3.** In any grouped frequency distribution class intervals are of equal width.

A. 1

B.

C.

D.

**Answer:**



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**4. Monthly income of workers of a factory is**

A. attribute

B. discrete variable

C. continuous variable

D. none of these.

**Answer:**



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5. The remainder when

$x^4 + 2x^3 - 13x^2 - 14x + 24$  is divisible by

$x + 4$  is

A. 0

B. 1

C. 3

D. none of these.

**Answer:**



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**6.** If  $p$  is prime and  $x$  is not divisible by  $p$ , then find the greatest common divisor of  $p$  and  $x$  is

A. 3

B. 0

C. 1

D. none of these.

**Answer:**



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7. If  $\Delta x = 1$ , then  $\Delta x^2 = \underline{\hspace{2cm}}$ .

A.  $2x + 1$

B.  $2x$

C.  $2x - 1$

D. none of these.

**Answer:**



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**8.** A coin is tossed three times in succession, the number of sample points in sample space is



A. 6

B. 8

C. 3

D. 9

**Answer:**



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**9. What is Nominal data ?**



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10. What do you mean by attribute ?



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11. Are the data  $n = 10$   $\sum_i x_i^2 = 400$ ,  $\bar{x} = 7$ ,

consistent ?



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12. What is Leptokurtic ?





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**13.** Explain the meaning of  $P(A \cup B) - P(A \cap B)$  for two events A and B.



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**14.** Give the definition of mutually exclusive events.



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**15.** State De Morgan's laws for two arbitrary events A and B ?



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



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**17.** Give the condition when two events A and B will be mutually independent?



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**18.** What is Life table?



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**19.** Give the formula of Fisher's index number ?



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20. Distinguish between positive skewness and negative skewness.



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21. Find the G.M. of  $n$  observations  $a, ar, ar^2, \dots, ar^{n-1}$



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22. Write the demerits of geometric mean?



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23. Express the following probabilities in the probability. Statement :  $P(A - B)$ .



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24. Express the following probabilities in the probability. Statement :  $P(A^c \cap B^c)$ .



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**25.** Prove that if  $A^c$  and  $B^c$  are independent, then are A and B?



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**26.** Write the classical definition of probability and state its limitations.



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27. What is Ogive? What are its uses?



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28. Describe the construction process of a questionnaire.



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29. The lower and the upper quartiles of a disiribution are 14.6 and 25.2 respectively and

the coefficient of skewness is 0.5. Find the median of the distribution.



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**30.** What is histogram? How does it differ from a bar diagram?



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**31.** State and prove Remainder theorem.



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**32.** Find a polynomial in  $x$ , of the second degree which vanishes when  $x = -3$  and have values 24 and 62 when  $x = 3$  and  $x = 4$  respectively.



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**33.** State and prove Cauchy-Schwartz inequality.



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**34.** Two unbiased dice are thrown. What is the probability that the sum of the numbers on the dice is 9?



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**35.** If  $P(A)=a$  and  $P(B)=b$ , Show that

$$P\left(\frac{A}{B}\right) \leq \frac{a}{b}.$$



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**36.** A card is drawn from each of two well shuffled pack of cards. Find the probability that at least one of them is a Jack?



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**37.** Discuss about different sources of data on vital events.



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**38.** Prove that Laspeyre's and Paasche's index numbers will be equal if the prices of all goods change in the same ratio.



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**39.** There are 10 persons in a room with average weight 50kg. Also it is given that the standard deviation of the weights is 10 kg. One man with 60 kg enters and man with 40 kg

goes out. Find the standard deviation of the new set of persons.



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**40.** Study the effect of change of origin and scale on mean deviation and quartile deviation.



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**41.** Two coins A and B have probability of head coming up in a single a toss and respictively.

One of the coins is selected at random and tossed twice. If two heads come up. What is the probability that the coin B was tossed?



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**42.** A string of lights contains 10 bulbs. If one bulb fails, The probability that a single bulb works for at least 700 hours is 0.95. If the bulbs works independently. What is the pobability that the string of 10 bulbs will work for at least 700 hours.





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43. Discuss different problems in the construction of price index number.



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44. Which of the following are true for all sets of data?

A.  $Mean \leq median \leq \text{mode}$

B.  $Mean \geq median \geq \text{mode}$

C. Mean = median = mode

D. none of these

**Answer:**



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

A. mean

B. median

C. mode

D. none of these

**Answer:**



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**46.** The numerical value of  $\frac{\text{mean} - \text{median}}{s. d.}$

cannot exceed unity. (write true or false).



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47. For any distribution  $m_1$  is

A. 0

B. 1

C. (-)1

D. none of these

**Answer:**



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48. If  $\alpha, \beta, \gamma$  are the roots of  $x^3 + px + q = 0$ , then  $\alpha\beta\gamma = \underline{\quad} \underline{\quad} \underline{\quad} \underline{\quad}$ .

A. 7

B. 8

C. 11

D. none of these

**Answer:**



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49. The degree of the polynomial

$$7x^5 + 5x^9 + 3x^2 + 4x + 1 \text{ is}$$

A. 18

B. 1

C. 7

D. 126

**Answer:**



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50. The greatest common divisor of 7 and 18 is

A. 1

B.  $\frac{1}{6}$

C.  $\frac{1}{18}$

D. none of these

**Answer:**



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51. The probability of getting 9 dots with two unbiased dice is

A. 0.4

B. 0.2

C. 0.8

D. none of these

**Answer:**



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52. If  $P(A) = \frac{1}{3}$ ,  $P(B) = \frac{1}{2}$ ,  $P(A|B) = \frac{1}{6}$ .

find  $P(B|A)$ .



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53. What is diet survey? Write the advantages and disadvantages of any two methods of diet survey.



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**54.** If  $2u = 5x$  is the relation between the variables  $x$  and  $u$  and geometric mean of  $x$  is 1, find the geometric mean of  $u$ .



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**55.** If the relation between  $x$  and  $y$  is  $2y - 6x = 6$  and if mode of  $x$  is 12, then find the mode of  $y$ .



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**56.** Are the following data consistent if  $b_1 = 0.7$  and  $b_2 = 1.5$  (symbol have their usual meanings)



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**57.** For two events A and B

$$P(A^c / BC) + P(A / B^c) = ?$$



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**58.** If  $P(A + B) = 2/3$  and  $P(A - B) = 1/3$ , then  $P(B)$   
= ?



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**59.** Write the sample space when one die is  
thrown twice.



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**60.** Define impossible event with examples.



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**61.** What is conditional probability?



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**62.** Why is Fisher's index number called ideal?



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**63.** Distinguish between discrete and continuous variable.



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**64.** Write down the merits and demerits of mass questionnaire method.



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**65.** If a value of a variable is zero, then what will be the value of A.M., G.M. and H.M. ?



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**66.** State and Prove Boole's inequality?



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**67.** State and Prove the theorem of compound probability. If events are independent, what

will be the form of the theorem?



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**68.** What is the probability of obtaining a multiple of 3 in the throw of a fair die?



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**69.** If a man walks along the four sides of a square ground with speeds  $v_1, v_2, v_3$  and  $v_4$



km/hour respectively, then what would be his average speed?



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**70.** Prove that the difference between the arithmetic mean and the median can not be greater than the standard deviation. ]



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71. The mean and s.d. of height readings of a group of employees of a firm are found to be 172 cm and 18 cm. While the same measure of their weight readings are 65 kg and 9 kg. Compare the variability of the height readings with that of the weight readings.



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72. Find  $\Delta^2 (e^{ax+b})$ , taking the interval of differencing as 1.





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73. Find the value of  $\log_{10} 3.5$  from the following table:



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74. Prove that  $\log_5^7 < \sqrt{2}$ .



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**75.** Find the probability that the birthday of 7 persons will fall on 7 different days of the week assuming equal probability for each of these days.



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**76.** An integer  $x$  is selected at random from the first 50 natural members. Calculate

$$P\left(x + \frac{96}{x} > 50\right)$$



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77. What do you mean by family budget enquiry?



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78. Write a short note on histogram of a frequency distribution.



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79. Write a short note on Pie chart?





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**80.** Prove that the variance of the first  $n$  odd positive integers is the same as the variance of the first  $n$  even positive integers.



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**81.** Five non-similar pairs of socks are in a closet. Four socks are selected at random. What is the probability that there will be

among the four socks chosen

no complete pair?



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**82.** Five non-similar pairs of socks are in a closet. Four socks are selected at random. What is the probability that there will be among the four socks chosen exactly one complete pair?



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**83.** The letter of word *SOCIETY* are placed at random in a row what is the probability that three vowels comes together?



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**84.** Prove that Marshall Edgeworth index number lies between laspeyers and Paasche's index numbers.



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