



# MATHS

## BOOKS - UNITED BOOK HOUSE

### Question Paper 2014

#### Exercise

1. The abscissa of the point of intersection of the less than and greater than ogives corresponds to

A. a) the arithmetic

B. b) the median

C. c) the mode

D. d) none of these

**Answer:**



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2. A frequency distribution of a variable can be represented by a frequency polygon when the variable is a

A. discrete one

B. continuous one

C. both I and ii

D. none of these

**Answer:**



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**3. In symmetric unimodal distribution**

A. a) mean It median It mode

B. b) mean = median = mode

C. c) mean gt median gt mode

D. d) none of these

**Answer:**



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**4.** The greatest common divisor (GCD) of 18 and 27 is

A. a) 6

B. b) 9

C. c) 3

D. d) none of these

**Answer:**



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**5. Which of the following is correct?**

A. a)  $15 \equiv 27 \pmod{5}$

B. b)  $15 \equiv 27 \pmod{3}$

C. c)  $15 \equiv 27 \pmod{7}$

D. d)  $15 \equiv 27 \pmod{11}$

**Answer:**



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**6.** If  $f(0) = 1$ ,  $f(1) = 4$ ,  $f(2) = 10$ , then the value of

$\Delta^2 f(0)$  is

A. (-)3

B. (-)6

C. 3

D. 6

**Answer:**



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7. If  $\alpha, \beta, \gamma$  are the roots of the equation  $px^3 - qx + r = 0$ , then the value of  $\alpha + \beta + \gamma$  is

A.  $q/p$

B.  $(-q)/P$

C. 0

D.  $(-r)$

**Answer:**



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**8.** For any two events  $A$  and  $B$ . Which of the following is correct?

A. a)  $P(A \cup B) = P(A) + P(B)$



B. b)

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

C. c)

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

D. d)  $P(A \cup B) = P(A)P(B)$

**Answer:**



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9. Two fair dice are thrown. If the sum of two numbers obtained is 8, then the probability that the first number is a 6 will be

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

B.  $\frac{5}{36}$

C.  $\frac{1}{4}$

D. none of these

**Answer:**



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**10.** If the number of educated persons is 65% of the population, then in Pie diagram..... angle is needed to mark the sector (Fill in the blank)



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**11.** If the AM of 13, 15, 16, 12,  $x$  be  $y$  and that of 13, 15, 16, 12,  $y$  be  $x$ , then find  $x$  and  $y$ .



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**12.** If arithmetic mean and coefficient of variation of  $x$  is 6 and 50% respectively, then what is the variance of  $x$ ?



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**13.** If  $2u = 5x$  and the harmonic mean of  $x$  is -0.4, then find the harmonic mean of  $u$ .



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14. If  $P(A \cup B) = \frac{2}{3}$  then find the value of  $P(A^c \cap B^c)$ .



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15. If  $P(A | B) = a$  and  $P(B) = b$ , then express  $P(B - A)$  in terms of  $a$  and  $b$ .



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**16.** What is the probability of drawing one white ball from a bag containing 6 red, 8 green and 10 black balls?



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**17.** If  $P(A | B) = 1/4$  , then what is the value of  $P\left(\frac{A^C}{B}\right)$ ?



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**18.** If  $P(A_1) = 0.2$ ,  $P(A_2) = 0.1$  and  $P(A_3) = 0.3$  and these events are mutually independent, then what is the value of  $P(A_1 \cap A_2 \cap A_3)$ ?



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**19.** If the cost of a dozen eggs is Rs. 48. Let's find the cost of 32 eggs.



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20. Write true or false: "Index number is unit free number".



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21. Find the arithmetic mean of first  $n$  odd positive integers.



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22. Find the harmonic mean of 1,  $\frac{1}{2}$ .

$\frac{1}{3}, \dots, \frac{1}{n}$



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23. If the standard deviation of the set of numbers 1, 2, 3,  $\dots$ , k is 2, then find the value of k.



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24. What are the limitations of the classical definition of probability?



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25. If  $P(A) = 1/2$ ,  $P(B) = 1/3$  and

$$P(A^c \cap B^c) = \frac{5}{12} \text{ find } P(A/B).$$



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**26.** If  $P(A \cup B) = \frac{7}{12}$  and  $P(A) = 1/3$  for two independent events A and B, then find value of  $P(B)$ .



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**27.** What are the differences between primary data and secondary data?



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**28.** If a variable be such that  $np$  observations are all equal to 1 and the remaining  $nq$  observations are all equal to 0 ( $p + q = 1$ ), then find the mean and standard deviation of that variable.



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**29.** Write any three measures of skewness of a distribution.



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**30.** If  $a$ ,  $b$  and  $c$  are three positive real numbers, show that

$$a^2 + b^2 + c^2 \geq ab + bc + ca$$



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**31.** What do you mean by interpolation? State Newton's backward interpolation formula.



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**32.** Find the polynomial function  $f(x)$  of degree 3 for which it is known that  $f(0) = 1$ ,  $f(1) = 2$ ,  $f(2) = 11$  and  $f(3) = 34$ .



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**33.** For three event  $A_1$ ,  $A_2$  and  $A_3$  state and prove Bonferroni's inequality.



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**34.** If an integer  $X$  is randomly selected from the first 50 positive integers, then find the value of  $p\left(x + \frac{96}{x} > 50\right)$ .



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**35.** The probability of the solving a problems in mathematics of three students are  $\frac{1}{3}, \frac{1}{5}, \frac{1}{6}$  . If they try to solve the problem together, find the probability that the problem is solved by at least one student.





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**36.** Examine whether Fisher's index satisfies both the time reversal and factor of reversal tests.



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**37.** Show that crude death rate can be expressed as weighted arithmetic mean of age-specific death rates.



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**38.** For any two events  $A_1$  and  $A_2$ , prove 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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**39.** Two coins A and B have probabilities of head  $1/4$  and  $3/4$  in a single toss respectively. One of the coins is selected at random and

tossed twice. If two heads come up what is the probability that coin B was tossed?

A.  $9/10$

B.  $2/5$

C.

D.

**Answer:**



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