MATHS

BOOKS - UNITED BOOK HOUSE

MODEL QUESTION PAPERS-SET 4

Exercise

1. Null set Is

A. a) $\{x : x^2 = 1 \text{ or } x = 2\}$

B. b){0}

C. c) $\{x : x^2 + 1 = 0\}$

D. d)$\{x : x > 0 \text{ or } x < 0\}$

Answer:

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2. The number of real solution of $x^2 - 3|x| + 2 = 0$ are

A. a)4

B. b)3

C. c)2

D. d)1

Answer:

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3. Z is a complex number and $Z.\overline{Z} = 0$, it is true only when

A. a)Re(z)=0

B. b)Im(z)=0

C. c)Re(z)+Im(z)=0

D. d) z is not equal to 0

Answer:

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4. If 4th,7th nd 10th term of G.P are x, y and z, then

A. a)y, x, z are in G.P.

B. b)z, y, x are in GP

C. c)x, y, z are in GP

D. d)x, y, z are in AP.

Answer:

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5. The co-ordinate of the foot of the perpendicular from the point (4, 3, 5) to z axis is

A. a)(0,0, 5)

B. b)) (0, 3, 0)

C. c)(0, 0, 4)

D. d)(4, 0, 0)

Answer:

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6. The equation of the circle passes through the point (0, 4), (0, 0) and (3, 0) is

A. a)$x^2 + y^2 - 4x - 3y = 0$

B. b)$x^2 + y^2 - 3x - 4y = 0$

C. c) $x^2 + y^2 - 4x + 3y = 0$

D. d) $x^2 + y^2 + 4x - 3y = 0$

Answer:

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7. The value of $\lim_{x \to 0} \frac{1 - \cos 4x}{x^2}$ is

A. a) -6

B. b) 6

C. c) 8

D. d) 2

Answer:

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8. If f(2) = 2, and f'(2) = 1, then the value of $\lim_{x \to 2} \frac{xf(2) - 2f(x)}{x - 2}$

A. a)0

B. b)1

C. c)-1

D. d)2

Answer:

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9. Three unbiased dice are thrown at a time. The probability of getting three distinct numbers in three dice is

A. a)1/9

B. b)1/36

C. c)5/9

D. d) $\frac{3}{2^3}$

Answer:

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10. If the variance of a distribution is 4 coefficient of variation is 5%,then mean of the distribution is ___

A. a)20

B. b)25

C. c)40

D. d)80

Answer:

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11. If $n(X) = 4$ and $n(Y) = 8$. Find the maximum and minimum numbers of.elements of $X \cup Y$

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12. If A $=\{(a, b): a+3b=12, a, b \in N\}$, find the range of A.

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13. Show that $\cos^6\theta + \sin^6\theta = \frac{1}{8}(5+3\cos 4\theta)$

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14. If n be an integer, then find the value of $\tan\left\{\frac{n\pi}{2} + (-1)^n \cdot \frac{\pi}{4}\right\}$.

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15. If (1 + i) (2 +i) (3 + i).....(n+i)=a+ib ,show that 2.5.10....

$(n^2+1) = a^2 + b^2$

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16. If n is a even number, find the sum of the series upto n terms$1^2 - 2^2 + 3^2 - 4^2 + 5^2 - .....$

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17. How many 5 digits telephone number can be formed from the digits from 0 to 9 when every number start

with 23 (no digit being repeated in any number)

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18. Find the value of $\frac{3^2}{3} \cdot \frac{3^2}{9} \cdot \frac{3^2}{27} \ldots\ldots$

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19. If the gradiant of the line joining the points $(2a, -2)$ and $(1, -a)$ is -2. Find the value of a.

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20. Find the ratio in which the plane 2x+3y+5z=1 divides the line segment joining the points (1,0,-3)and (1,-5,7).

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21. Evaluate: $\lim_{x \to 0} \frac{\sin x}{x}$

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22. Find the condition for the existance of $\lim_{x \to 0} f(x)$

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23. Find the variance of 1, 2, 3, 4.

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24. There are four letters and four envelops with proper address. Find the probability that the letters are not in proper envelops.

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25. For any three sets $A, B, C.$ prove that $A \times (B \cup C) = (A \times B) \cup (A \times C)$

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26. If $\cos\alpha = k\cos\beta$ Show that $\tan\left(\frac{\alpha+\beta}{2}\right) = \frac{1-k}{1+k}\cot\left(\frac{\alpha-\beta}{2}\right)$

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27. Solve : $\sec\theta - 1 = \left(\sqrt{2}-1\right)\tan\theta$

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28. Prove by mathematical induction.

$$\frac{1}{1.3} + \frac{1}{3.5} + \frac{1}{5.7} + \ldots + \frac{1}{(2n-1)(2n+1)} = \frac{n}{2n+1}$$

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29. How many different arragements of the letters of the word ALGEBRA can be made so that the two 'A' is do not come together.

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30. If the sum of the n term of an AP is $n^2 + 2n$. which, term will be 201?

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31. If z=x+iy and $\frac{z-i}{z+1}$ is purely imaginary,then show that the point z always lies on a circle.

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32. The equation of the two adjacent sides of a parallelogram are $4x+ 5y = 0$ and $7x + 2y =.0$and equation of one of the diagonal is $1 lx + 7y = 9$, find the equation of other diagonal.

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33. In a rectangle, the co-ordinates of the end point of a diagonal are (2, 3) and (8, II) and other diagonal is parallel to y axis. Find the co-ordinate of the end points of other diagonal.

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34. If the straight line dx + cy = cd is perpendicular the line joining the points (4, 5) and (3.-8) and also it passes through (6, I). Find the value of c and d

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35. Find the equation of a circle which passes through $(0, -3)$ and $(3, -4)$ and the centre lies on the straight line $2x - 5y + 12 = 0$.

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36. Evaluate: $\lim_{x \to 0} \frac{\sqrt{1+x^2} - \sqrt{1+x}}{\sqrt{1+x^3} - \sqrt{1+x}}$

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37. If f(x)=x|x|,prove that f'(x)=2|x|.

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38. 'If x is a whole number and x^2 is even, then x is also an even number'. Find the truth value of this statement by contrapositive method.

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39. 'If a and b are two odd integer, then (a + b) is an even intege."—examine whether this compound statement is true of false

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40. One cord is drawn at random a pack of 52 c'ards..Find the probability the card will be either a king or a Hearts or red?

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41. Find the mean and variance for the following frequency distributions in

Classes	0-10	10-20	20-30	30-40	40-50
Frequencies	5	8	15	16	6

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42. Solve : $2\cos^2 2\theta \cos 5\theta + 2 = \sin^2 \theta, \theta \in R.$

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43. If $\frac{1}{-}$^5C_r)+1/(^ $6C_r\Big) + \frac{1}{{}^{4}C_r}$ find the value of r.

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44. Show that there are 72 ways of selecting 5 letters from the word INDEPENDENT.

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45. The co-ordinate of vertex and focus of a parabola $x^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$ are $(2, 4)$ and $(6, 2)$. Find the the value of $b, h, g. f, c.$

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46. Prove that the 4 foci of the two ellipses $25x^2 + 169y^2 = 4225$ and $400x^2 + 256y^2 = 102400$

are concyclics.

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47. Show that the difference of the focal distances of any point on the hyperbola $9x^2 - 4y^2 = 36$ is equal to its transverse axis.

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