MATHS

BOOKS - UNITED BOOK HOUSE

ANNUAL EXAMINATION QUESTION PAPERS 2018

Exercise

1. Write down all the subsets of the following sets

ϕ

A. a) 0

B. b) 1

C. c)2

D. d)None of these

Answer:

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2. Value of $w^n + w^{2n}$,where $w = \frac{-1 + i\sqrt{3}}{2}$and n=3k+1,is____

A. a)0

B. b)-1

C. c)1

D. d)None of these

Answer:

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3. If ^nC_p= ^ nC_qthen ____

A. a)$n \neq p$ or $p+q=n$

B. b)p=q or p-q=n

C. c)$n=p=q \neq n$

D. d)p=qor p+q=n.

Answer:

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4. Value of $\sin 36^\circ$ is _____

A. a) $\frac{1}{4}\sqrt{10-2\sqrt{5}}$

B. b) $\frac{1}{4}\sqrt{10+2\sqrt{5}}$

C. c) $\frac{1}{4}\sqrt{10+\sqrt{5}}$

D. d) $\frac{1}{4}\sqrt{10-\sqrt{5}}$

Answer:

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5. The value of $\lim_{x \to 4}\left(\frac{e^x - e^4}{x-4}\right)$ is _____

A. a) e^{-4}

B. b) e^4

C. c)1

D. d)None of these

Answer:

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6. Find the point of z-axis which equidistant from the points (1,5,7) and (5,1,-4)___

A. a)(0,0,3/2)

B. b)(0,0,5)

C. c)(0,5,0)

D. d)(4,2,3)

Answer:

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7. The angle made by the straight line $x\cos\alpha + y\sin\alpha = p$ with the negative direction of x-axis is ____

A. a) $\frac{\pi}{2} + \alpha$

B. b) α

C. c) $-\alpha$

D. d) $\frac{\pi}{2} - \alpha$

Answer:

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8. If f(x)=|x|,then f(0) Is ___

A. a)0

B. b)1

C. c)-1

D. d)None of these

Answer:

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9. In single throw of two dice,the probality of obtaning 'a total of 8' is___

A. a)8/36

B. b)3/36

C. c)9/36

D. d)5/36

Answer:

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10. If y=2x+3,and variance of y is 4,then the standard deviation of x is ____

A. a)-1

B. b)4

C. c)1

D. d)2

Answer:

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11. If $A \cap B^1 = \phi$,then show that $A = A \cap B$and hence show that $A \subseteq B$.

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12. Find the domain and range of the real function $f(x) = \frac{1}{(1 - x^2)}$

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13. Prove that $\cos^2 48^\circ - \sin^2 12^\circ = \frac{\left(\sqrt{5}+1\right)}{8}$

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14. Show that cot 2x.cotx-cot3x.cot2x-cot3x.cotx=1

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15. Find the value of n so that $\frac{a^{n+1}+b^{n+1}}{a^n+b^n}$ may be the geometric mean between a and b.

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16. Find the value of r,if the coefficients of (2r+4)th and (r-2) -th terms in the expansion of $(1+x)^{18}$ are equal

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17. Find the principal amplitude of (-1-i).

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18. Find the number of squares in chess board.

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19. Find the focus of the parabola $y = x^2 + x + 1$.

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20. Find the equation of a circle with centre (h,k)and touching both the axes.

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21. Evaluate $\lim_{x \to \pi/6} \frac{\sqrt{3}\sin x - \cos x}{\left(x - \frac{\pi}{6}\right)}$

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22. Prove that the derivative of an odd function an ever function .

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23. Find the mean and variance for each of the data in

First n natural numbers

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24. If P(A)=2/3,P(B)=1/2,$P(A \cap B) = \frac{1}{6}$,then find the value of $P(A \cap B')$and $P(A \cup B)$

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25. Let $A = \{x \in N : x^2 - 5x + 6 = 0\}$. $B = \{x \in W : 0 \leq x < 2\}$and $C = \{x \in N : x < 3\}$

,then verify that $A \times (B \cup C) = (A \times B) \cup (A \times C)$

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26. Prove that in any $\triangle ABC$.

$$(b-c)\cot\left(\frac{A}{2}\right) + (c-a)\cot\left(\frac{B}{2}\right) + (a-b)\cot\left(\frac{C}{2}\right) = 0$$

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27. Solve $\sec x - \tan x = \sqrt{3}$

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28. If P-th ,q-th and r-th terms of an AP as well those of a GP are a,b,c respectively,then prove that $a^{b-c}:b^{c-a}:c^{a-b}=1$

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29. Using the principle of mathematical induction ,prove that $x^n-y^n$is divisible by (x-y) for all $n\in N$.

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30. If z=x+iy and$w=\frac{1-iz}{1+iz}$such that |w|=1.then show that z is purely real.

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31. Find the rank of the word 'MOTHER' in dicitonary format.

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32. If the coefficients of 2nd,3rd and 4th terms in the $(1+x)^{2n}$ are in A.Pshow that $2n^2 - 9n + 7 = 0$

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33. (2a,0) and (0,a) are the extremities of the base of an isosceles triangle ,and the equation of one of the equal

sides is x=2a.Find the equation o the other two sides and the area of triangle .

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34. A variable straight line passes through the point of intersection of the staright lines x/a+y/b=1 and x/b+y/a=1 and intersects the axes at P and Q.Find the locus of mid-point of Pq.

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35. The abscissae of two points A and B are the roots of the equation $x^2 + 2ax - b^2 = 0$and their ordinates are

the equation $x^2 + 2px - q^2 = 0$.Find the equation and the radis of the circle with AB as diameter.

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36. If 2f(x)+f(-x)=1+x,find f'(10),where f'(x) denote derivative of f(x).

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37. Evaluate $\lim_{x \to \pi/4} \frac{4\sqrt{2} - (\cos x + \sin x)^5}{1 - \sin 2x}$

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38. Write the negation of each of the following statements:p:for every real numberx,$x^2 > x$.

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39. Write the negation of each of the following statements:q:For every real number x,either x>1or x<1.

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40. "Mathematics is fun"check whether this sentence is a statement .

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41. p: If x is a real number such that $x^3 + 4x = 0$,then x=0,prove that p is true statement ,using method of contradiction

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42. p: If x is a real number such that $x^3 + 4x = 0$,then x=0,prove that p is true statement ,using method of contraopositive.

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43. A bag contains 5 white and 4 black balls.If 3 balls are drawn at random,find the probability that at least two of

them are white.

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44. The arithmetic mean and standard deviation of 7 observations are respectively 8 and 4.If five of the observations are 2,4,10,12 and 14 then find the values of the remaining two

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45. Prove that if $x = a(\cos\theta + \sin\theta\sin 2\theta)$and $y = a(\sin\theta + \cos\theta\sin 2\theta)$,then show that $(x+y)^{2/3} + (x-y)^{2/3} = 2a^{2/3}$

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46. Show that $3\left\{\sin^4\left(\frac{3\pi}{2}-\alpha\right)+\sin^4(3\pi+\alpha)\right\}-2\left\{\sin^6\left(\frac{\pi}{2}+\alpha\right)+\sin^6(5\pi-\alpha)\right\}=1$

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47. Draw the graph of the solution set of the inequations $2x+y\geq 2, x-y\leq 1, x+2y\leq 8, x\geq 0$ and $y\geq 0$ also shade the solution region .(graph paper not necessary).

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48. Find the number of permutations and the number of combinations in the letters of the word 'EXPRESSION' taken four at a time.

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49. Find the sum of the integers between 90 and 890 which are perfect squares.

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50. If $z_1$and $z_2$be two non-zero complex numbers such that $|z_1 + z_2| = |z_1| + |z_2|$,then prove that $argz_1 - argz_2 = 0.$

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51. The directrix of a parabola is x+y+4=0and vertex is at (-1,-1).Find the position of the focus and the equation of parabola.

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52. Prove tha the major axis of an ellipse is greater than its minor axis.

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53. Find the eccentricity of a hyperbola whose conjugate axis and latus rectum are equal.