MATHS

BOOKS - UNITED BOOK HOUSE

MODEL QUESTION PAPERS-SET 12

Exercise

1. Which of the following sets have only one subset

A. a){0}

B. b)$\{\phi, 0\}$

C. c)$\{\phi\}$

D. d){1}

Answer:

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2. The value of $1 + i^2 + i^4 + i^6 + \ldots + i^{16}$ is

A. a)-1

B. b)1

C. c)0

D. d)2

Answer:

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3. No of diagonals of a 12 sided polygon are

A. a)12

B. b)49

C. c)54

D. d)62

Answer:

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4. If the sum of theree cosecutive numbers of an AP is 45, then the middle number will be

A. a)19

B. b)15

C. c)20

D. d)22.5

Answer:

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5. The acute angle between the two lines' 7x - 4y = 0 and 3x -11y = 2 will be

A. a) $\frac{\pi}{3}$

B. b) $\frac{\pi}{4}$

C. c) $\frac{\pi}{6}$

D. d) $\frac{2\pi}{6}$

Answer:

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6. The circle $x^2 + y^2 - 2x - 2y + k = 0$ represents a point circle when k.=

A. a) 0

B. b) -1

C. c)1

D. d)2

Answer:

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7. The value of $\lim_{x \to 3} \frac{\sqrt{x+3} + \sqrt{x-3}}{x}$ is

A. a) $\frac{\sqrt{6}}{3}$

B. b) $-\frac{\sqrt{6}}{3}$

C. c)3

D. d)0

Answer:

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8. If f(x)=$2x^3 - 3x^2 + 4x - 2$,then the value of $f'(3)$ is

A. a)0

B. b)30

C. c)40

D. d)50

Answer:

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9. Two dice are thrown at a time.The probability that the sum of two numbers is equal to 5 is

A. a)1/5

B. b)1/9

C. c)2/5

D. d)2/9

Answer:

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10. The median of 1st 2013 natural number is

A. a)1007

B. b)1090

C. c)1008

D. d)None of these.

Answer:

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11. For any two sets A and B, if $A \cup B = A \cap B$, then show that A = B.

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12. A = {1, 2, 3, 4, 5}, B = {1, 3, 4} and the relation R from set A to set B where $(x, y) \in R$ implies x > y. Find the ordered pairs of R^{-1}

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13. Show that $\tan 67^\circ - \tan 22^\circ - \tan 67^\circ \tan 22^\circ = 1$

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14. In $\triangle ABC$, if $\angle C = 90^\circ$,. then find the value of tan A + tan B.

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15. If ^nP_r=120 ^nC_(n-r) , find the value of r.

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16. x.and y are- real and if x + iy.=$\frac{5}{-3+4i}$,find the value of x and y.

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17. Find the constant term of the expansion of $\left(a^3 - \frac{1}{a^2}\right)^{15}$

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18. If the P th term of an AP is (3P - 5), then find the common difference and 15th term of this AP.

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19. Find the equation of a straight fine passes through the middle ofthe straight lines 2x - 3y + 1 =0 and 2x- 7= 3y.

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20. Find the ratio in which the plane xy divides the join of A(2, 3. 5) and B(-2, -5, -3).

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21. If $y = xe^x$,show that xdy/dx=(1+x)y.

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22. $f(x) = x^2 + ax$,when $0 \leq x \leq 1$ and $f(x) = 3 - bx^2$,when $1 \leq x \leq 2$ if $\lim x \to 1 f(x) = 4$,then find the value of a and b.

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23. A unbiased coin tossed three times. Find the probability of getting 1 head

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

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25. For any two sets, show that $(A \cap B) \cup (A - B) = A$.

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26. If $\tan^2 \alpha = 1 + 2\tan^2 \beta$, show that $\cos 2\beta = 1 + 2\cos 2\alpha$.

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27. Solve :sin x 4 cos x = sin 2x 4 cos 2x.

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28. Prove by mathematical induction, $1+\frac{1}{4}+\frac{1}{9}+\ldots+\frac{1}{n^2}<2-\frac{1}{n}$ when $n \geq 2$, is a integer.

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29. If $\arg\left(\frac{z-1}{z+1}\right)=\frac{\pi}{4}$„ then show that in complex plane, the locus of z is a cricle.

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30. Find the term independent of x of the expansion of $(1+x)^3\left(x-\frac{1}{x}\right)^6$

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31. If pth, qth and rth terms of on AP are a. b and c, then show that a(q - r) + b(r - p) + c(p - q) = 0.

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32. A straight line form a right angled triangle with the axes. If the length of hypotenus and area of this triangle are 13 unit and 30 sq unit, find the equation of this straight line.

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33. If the co-ordinate of vertices of a triangle are (10, 4), (-4, 9) and (-2, -1). Find the the co-ordinate of its ortho centre.

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34. Find the co-ordinate of a point on the circle $x^2 + y^2 - 4x + 2y - 20 = 0$ nearest to $\left(2, \frac{3}{2}\right)$.

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35. The co-ordinate of the vertices of a triangle are A(0, 2, -3), B(- 2, 0, -4) and C(3, 6, -3). Find the ratio in which the bisector of $\angle BAC$ divides BC and also find the co-ordinate of that point

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36. Differentiate $x + \frac{1}{x}(x \neq 0)$ at x = 1, with respect to x, with the help of 1st principle

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37. Evaluate : $\lim_{x \to 0} \frac{\sin\left(x^2 + 4x\right)}{x^3 - 5x^2 + 2x}$

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38. 'If p' and q are rational numbers, then pq is also rational convert this compound statement into a simple statement and check whether the statement is true of false.

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39. 'Square of a whole number is positive or negative'-find the validity of this compound statement.

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40. If two numbers a and b are-chosen at random from the 1st 30 natural numbers, find the probability that the expresion $\left(a^2 - b^2\right)$ is divisible by 3.

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41. Find A.M. and SD of the following distribution table :

Class interval	0-10	10-20	20-30	30-40	40-50
friquency	5	8	15	16	6

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42. Using vector method in a triangle , prove that,

(i) $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ and

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43. If α,β positive acute angles and $\sec(\alpha+\beta) - \sec(\alpha-\beta) = 2\cos ec\alpha$ show that $\sin\alpha = \cos\left(\frac{\beta}{2}\right) - \sin\left(\frac{\beta}{2}\right)$

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44. Draw the graph and find the common region of the system of following inequations :

$x + y \leq 5, 2x - 3y \geq 6, x \geq 2.$

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45. if $z_1 = 1 + i\sqrt{3}, z_2 = \sqrt{3} - i$show that (a)arg $(z_1 z_2) = arg(z_1) + arg(z_2)$and (b) $arg(z_1 / z_2) = arg(z_1) - arg(z_2)$

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46. Find the vlaue of $47C_4 + \sum_{r=0}^{3} (50 -^r C_3)$

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47. Find the length of the normal chord of a parabola $y^2 = 4x$, which makes an angle 45° with its axes.

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48. If θ and ϕ are the eccentric angles of the end points of a chord which passes through the focus .of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$.Show that $\tan(0/2)\tan(\phi/2)=\left(\frac{e-1}{e+1}\right)$,where e is the eccentricity of the ellipse.

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49. Find the equation of a hyperbola, having foci (± 7.0) and its eccentricity is $4/3$.

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