

Previous Year Paper

Mathematics - 2001



Multiple Choice Questions

- 1. In a competition A, B, C are participating the probability that A wins is twice that of B, the probability that B wins is twice that of C, then probability that A loses is
 - A. 17
 - B. 27
 - C. 47
 - D. 37

Answer

- 2. The probability that a number selected at random from the set of numbers (1, 2, 3, ..., 100) is a cube, is
 - A. 125
 - B. 225
 - C. 325
 - D. 425

Answer

- 3. Two dice are rolled simultaneously. The probability that the sum of the two numbers on the dice is a prime number, is
 - A. 512
 - B. 712
 - C. 912
 - D. 0.25

Answer

- 4. The events A andB have probabilities 0.25 and 0.50, respectively. The probability that both A and B occur simultaneously is 0.14, then the probability that neither A nor B occurs, is
 - A. 0.39
 - B. 0.29
 - C. 0.11
 - D. 0.25

Answer

- 5. For all values of a and b the line (a + 2b)x + (a by + (a + 5b) = 0 passes through the point.
 - A. (-1,2)
 - B. (2, 1)
 - C (- 2 1)

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6. The lines 2x + 3y = 6, $2x^{1} + 3y = 8$ cut the X-axis at A and B, respectively. A line L drawn through the point (2, 2) meets the X-axis as Consult on Study and Answers. Free Forever C are in

arithmetic progression. Then, the equation of the line L is

A. 2x + 3y = 10

- B. 8x + 2y = 10
- C. 2x 3y = 10
- D. 8x 2y = 10

Answer

7. The number of circles that touch all the straight lines x + y = 4, x - y = -2 and y = 2 is

- A. 1
- B. 2
- С. З
- D. 4

Answer

8. The incentre of triangle formed by the lines x + y = 1, x = 1, y = 1 is

- A. 1 12, 1 12
- B. 1 12, 12
- C. 12, 12
- D. 12, 1 12

Answer

9. The orthocentre of triangle formed by the lines x + 3y = 10 and $6x^2 + xy - y^2 = 0$ is

- A. (1, 3)
- B. (3, 1)
- C. (-1,3)
- D. (1, 3)

Answer

- 10. If one of the lines of pair of straight lines $ax^2 + 2hxy + by^2 = 0$ bisects the angle between the coordinate axes, then
 - A. $a^2 + b^2 = h^2$

B.
$$(a + b)^2 = 4h^2$$

- C. $a^2 + b^2 = 4h^2$
- D. $(a + b)^2 = h^2$

Answer

- 11. If the slope of one lne is twice the slope of other in the pair of straight lines $ax^2 + 2hxy + by^2 =$
 - 0, then $8h^2$ is equal to

A. - 9ab

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C. - 7ab

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Answer

- 12. If the extremities of diagonal of a square (1, 2, 3), (2, 3, 5), then the length of its side, is
 - A. 6
 - B. 3
 - C. 5
 - D. 7

Answer

13. The foot of the perpendicular from (0, 2, 3) to the line x + 35 = y - 12 = z + 43 is

- A. (-2,3,4)
- B. (2, -1, 3)
- C. (2, 3, -1)
- D. (3, 2, 1)

Answer

- 14. If a line makes angle π 3 and π 4 with the X-axis and Y-axis respectively, then the angle made by the line with the Z-axis is
 - Α. π2
 - Β. π4
 - C. 5π12
 - D. π3

Answer

15. The equation of the normal to the circle $x^2 + y^2 + 6x + 4y - 3 = 0$ at (1, - 2) is

- A. y + 1 = 0B. y + 2 = 0C. y + 3 = 0D. y - 2 = 0Answer
- 16. The limiting points of the co-axial system containing the two circles $x^2 + y^2 + 2x 2y + 2 = 0$

and 25(x² + y) - 10x - 80y + 65 = 0 are A. (1, - 1), (- 3, - 40) B. 1, - 1, - 15, 85 C. - 1, 1, 15, 85 D. - 15, - 85 Answer

17. The radical axis of circles $x^2 + y^2 + 5x + 4y - 5 = 0$ and $x^2 + y^2 - 3x + 5y - 6 = 0$ is

```
A. 8y - x + 1 = 0
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D. y - 8x + 1 = 0

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- 18. If the polar of a point on the circle $x^2 + y^2 = p^2$ with respect to the circle $x^2 + y^2 = q^2$ touches the
 - circle $x^2 + y^2 = r$, then p, q, r are in
 - A. AP
 - B. GP
 - C. HP
 - D. AGP

Answer

- 19. The length of latusrectum of parabola $y^2 + 8x 2y + 17 = 0$ is
 - A. 2
 - B. 4
 - C. 8
 - D. 16

Answer

- 20. If the normal to the parabola $y^2 = 4x$ at P(1, 2) meets the parabola again in Q, then coordinates of Q are
 - A. (- 6, 9)
 - B. (9, 6)
 - C. (- 9, 6)
 - D. (- 6, 9)

Answer

- 21. The eccentricity of ellipse x216 + y29 = 1 is
 - A. 716
 - B. 54
 - C. 74
 - D. 72

Answer

- 22. The products of lengths of perpendiculars from any point of hyperbola $x^2 y^2 = 8$ to its asymptotes, is
 - A. 2
 - B. 3
 - C. 4
 - D. 8

Answer

23. The equation $16x^2 + y^2 + 8xy - 74x - 78y + 212 = 0$ represents

A. a circle Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com



C. an ellipse

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Answer

- 24. Equation of curve in polar coordinates is $Ir = 2sin2\theta 2$ represents
 - A. a straight line
 - B. a parabola
 - C. a circle
 - D. an ellipse

Answer

- 25. $\lim x \to \infty x + ax + ba + b$ is equal to
 - A. 1
 - B. 1^{b a}
 - C. e^{a b}
 - D. e^b

Answer

- 26. $\lim x \to 0x$. 10x x1 cosx is equal to
 - A. log10
 - B. 2log10
 - C. 3log10
 - D. 4log10

Answer

27. If y_k is the kth derivative of y with respect to 'x', and y = cos(sin(x)), then y1sinx + y2cosx is

equal to

- A. ysin3x
- B. ysin3x
- C. ycos3x
- D. ycos3x

Answer

- 28. $tan\theta + cot\theta = 2 = 2$, then $sin\theta$ is equal to
 - A. 12
 - B. 13
 - C. 12
 - D. 1

Answer

29. $f(x) = (20 - x^4)^{1/4}$ for 0 < x < 5, then ff12 is equal to

A. 2⁻⁴

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30. 8 + 28 + 8 - 288 + 28 - 8 - 28 is equal to
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- A. 2
- B. 7
- C. 7
- D. 2

Answer

31. $x = \log_{0.1}(0.001)$, $y = \log_9(81)$, then x - 2y is equal to

- A. 3 2
- B. 3 2
- C. 2 1
- D. 2 2

Answer

32. If $2^3 + 4^3 + 6^3 + ... + 2(n)^3 = hn^2(n + 1)^2$, then h is equal to

- A. 12
- B. 1
- C. 32
- D. 2

Answer

- 33. The number of ways in which 5 boys and 4 girls sit around a circular tables. So, that no two girls sit together is
 - A. 5! 4!
 - B. 3! 3!
 - C. 5!
 - D. 4!

Answer

- 34. Using the digits 0, 2, 4, 6, 8 not more than once in any number, the number of 5 digited numbers that can be formed, is
 - A. 16
 - B. 24
 - C. 96
 - D. 120

Answer

35. 1 + 14 + 14 . 38 + 14 . 38 . 512 + . . . is equal to

A. 2

B. 12

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36. The Coefficient of x4 in the expansion of ar Bapers 20 uestions and Answers. Free Forever.

A. 1

Answer

- B. 2
- C. 3
- D. 4

Answer

- 37. If 1 + xn = C0 + C1x + C2x2 + + Cnxn, then C0 + 2C1 + 3C2 + + n + 1Cn is equal to A. 2n + n 2n - 1
 - B. 2n + n 2n
 - C. 2n + n + 12n
 - D. 2n 1 + n 12n

Answer

38. If $x - 4x^2 - 5x - 2k = 2x - 2 - 1x + k'$, then k is equal to

- A. 3
- B. 2
- C. 2
- D. 3

Answer

39. 22! + 2 + 43! + 2 + 4 + 64! + ...is equal to

- A. e B. e - 1
- C. e 2
- D. e 3

Answer

40. x < 1,the coefficient of x3 in the expansion of log 1 + x + x2 in ascendingnpowers of x,is

- A. 23
- B. 43
- C. 23
- D. 43

Answer

- 41. If α , β are the roots of the equation $x^2 + bx + c = 0$ and $a\alpha + h$, $\beta + h$ are the roots of the equation $x^2 + qx + r = 0$, then h is equal to
 - A. b + q B. b - q C. 12b + q D. 12b - q

Answer Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com **Mathematics**

A. ± 32

42. 202 -] 还在 2010 \$3x2 - 2, then x is equal t

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C. ± 43

D. ± 54

Answer

- 43. Each of the roots of the equation $x^3 6x^2 + 6x 5 = 0$ are increased by h. So that the new transformed equation does not contain x term, then h is equal to
 - A. 1
 - B. 2
 - C. 12
 - D. 13

Answer

44. The roots of the equation $x^3 - 14x^2 + 56x - 64 = 9$ are in

- A. AGP
- B. HP
- C. AP
- D. GP

Answer

45. If 1 is a multiple root of order 3 for the equation $x^4 - 2x^3 + 2x - 1 = 0$, then the other root is

- A. 0
- B. 1
- C. 1
- D. 2

Answer

- 46. $\lim x \rightarrow 0 \sin x \sin -1xx^2$ is equal to
 - A. 0
 - B. 1
 - C. 1
 - D. ∞

Answer

47. The biquadratic equation, two of whose roots are 1 + i, 1 - 2, is

A. $x^4 - 4x^3 + 5x^2 - 2x - 2 = 0$ B. $x^4 + 4x^3 - 5x^2 + 2x + 2 = 0$ C. $x^4 + 4x^3 - 5x^2 + 2x - 2 = 0$ D. $x^4 + 4x^3 + 5x^2 - 2x + 2 = 0$

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B. parabola

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D. hyperbola

Answer

49. If $\theta = \pi 6$, then the 10th term of $1 + \cos \theta + i \sin \theta + \cos \theta + i \sin \theta 2 + \cos \theta + i \sin \theta 3 + ...$ is equal to

- A. i
- B. 1
- C. 1
- D. i

Answer

50. $sin5\theta sin\theta$ is equal to

- A. $16\cos 4\theta 12\cos 2\theta + 1$
- B. $16\cos 4\theta + 12\cos 2\theta + 1$
- C. 16cos40 12cos20 1
- D. $16\cos 4\theta + 12\cos 2\theta 1$

Answer

51. $\cos 2\pi 6 + \theta - \sin 2\pi 6 + \theta$ is equal to

- A. 12cos2θ
- B. 0
- C. 12cos20
- D. 12

Answer

52. In $\triangle ABC$, cosC + cosAc + a + cosBb is equal to

- A. 1a
- B. 1b
- C. c + ab
- D. 1

Answer

53. In $\triangle ABC$, ab2 - c2 + cb2 - a2 = 0, then B is equal to

- Α. π2
- Β. π4
- C. 2π3
- D. π3

Answer

- 54. In $\triangle ABC,a2sin(2C) + c2sin(2A)$ is equal to
 - Α. Δ
 - B. 2∆
 - C. 3Δ

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- 55. The shadow of a tower standing on a level ground is found to be 60m longer when the sun'saltitu de is Study, Assignments, Solved Previous, Year, Papers, Questions and Answers. Free Forever.
 - A. 30m
 - B. 90m
 - C. 603m
 - D. 303 + 1m

Answer

- 56. If $cosec\theta = p + qp q$, then $cot\pi 4 + \theta 4$ is equal to
 - A. pq
 - B. qp
 - C. pq
 - D. pq

Answer

57. If $f(x) = x^2 - 10x + 25x^2 - 7x + 10$ and f is continuous at x = 5, then f(5) is equal to

- A. 0
- B. 5
- C. 10
- D. 25

Answer

58. If h(x) = xxx, then at x = 1, h'xhx is equal to

- A. h(x)
- B. 1hx
- C. 1 + loghx
- D. loghx

Answer

- 59. ddxsin-13x 4x3 is equal to
 - A. 34 x2
 - B. 31 x2
 - C. 14 x2
 - D. 14 x2

Answer

- 60. If f(x) = x2x + a, then f''(a) is equal to
 - A. 4a
 - B. 18a
 - C. 14a
 - D. 8a

Answer

61. The minimum value of x - αx - β is

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C. 14α - β2

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Answer

- 62. The equation of tangent to the curve $6y = 7 x^3$ at (1, 1) is
 - A. 2x + y = 3B. x + 2y = 3C. x + y = 1D. x + y + 2 = 0

Answer

- 63. The maximum value of xy subject to x + y = 7 is
 - A. 10
 - B. 12
 - C. 494
 - D. 554

Answer

64. If u = ex2 - y2, then

- A. $xu_x = yu_y$
- B. $yu_x = xy_y$
- C. $yu_x + xu_y = 0$
- D. $x^2u_y + y^2u_x = 0$

Answer

65. If u = xy2tan-1yx, then $x\partial u\partial x + y\partial u\partial y$ is equal to

- A. 2u
- B. u
- C. 3u
- D. 13u

Answer

- 66. The family of curves in which the sub-tangent at any point to any curve is double the abscissa is given by
 - A. $x = Cy^2$
 - B. $y = Cx^2$
 - C. $x^2 = Cy^2$
 - D. $y^2 = Cx^2$

Answer

67. Let Z denote the set of integers define $f : Z \rightarrow Z$ by $f(x) = x^2$, x is even 0, x is odd, then f is

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A. onto but not one-one
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Mathematics



CIEEe200@1and onto D. neither one-one nor onto Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever. 68. Let $f : R \rightarrow R$ be defined by $fx = x + 2, x \le -1x2, -1 < x < 12 - x, x \ge 1$ Then, the value of f(-1.75) + f(0.5) + f(1.5) is A. 0 B. 1 C. 2 D. - 1 Answer 69. Two functions f : R \rightarrow R, g : R \rightarrow R are defined as follows fx = 0, x is rational1, x is irationalgx = -1, x is rational0, x is irrational Then, (fog) π + (gof) (e) is equal to A. 0 B. - 1 C. 2 D. 1 Answer 70. If A = - 22- 32, B = 0- 110, then $(B^{-1}A^{-1})$ is equal to A. 2223 B. 3-222 C. 1102223 D. 11032-22 Answer 71. A square matrix $[a_0]$ in which $a_0 = 0$ for $i \neq j$ and $a_0 = k$ (constant) for i = j is called a A. unit matrix B. scalar matrix C. null matrix D. diagonal matrix Answer 72. If A = 023-4, hA = 03a2b24, then the values of h, a, b are respectively

A. - 6, - 12, - 18
B. - 6, 4, 9
C. - 6, - 4, - 9
D. - 6, + 12, 18

Answer

73. If 1 - ii1 + 2i - i = x + iy, then x is equal to Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com



D. 2

B. - 1

Answer

74. sec2tan - 12 + cosec2 cot - 13 is equal to

- A. 3
- B. 10
- C. 15
- D. 20

Answer

75. sinh - 1x1 - x2 is equal to

- A. coth 1x
- B. sinh 1x
- C. tanh 1x
- D. tanh 1x

Answer

76. If $a = i^{+} + 4j^{+}$, $b = 2i^{-} - 2j^{+}$, $c = 5i^{+} + 9j^{+}$, then c is equal to

- A. 2a + b
- B. a + 2b
- C. 3a + b
- D. a + 3b

Answer

77. ABCD is a parallelogram, with AC, BD as diagonals, then AC - BD is equal to

- A. 4AB
- B. AB
- C. 3AB
- D. 2AB

Answer

78. If $a = i^{+} j^{+} tk^{-}$, $b = i^{+} 2j^{+} 3k^{-}$ then the values of 't' for which (a + b) and (a - b) are perpendicular, are

- A. ± 2
- B. ± 23
- C. ±32
- D. ± 3

Answer

79. If θ is the angle between a and b and a \times b = a . b, then θ is equal to

A. 0

Β. π

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A. 0

Answer

- B. 1
- C. 2
- D. 3

Answer

81. a, b, c, d are coplanar vectors, then $(a \times b) \times (c \times d)$ is equal to

- A. 0
- B. 1
- C. a
- D. b

Answer

- 82. Find the binomial probability distribution whose mean is 3 and variance is 2.
 - A. 23 + 139
 - B. 53 + 239
 - C. 33 + 129
 - D. None of these

Answer

83. For a binominal variate X, if n = 4 and P(X = 4) = 6P(X = 2), then the value of p is

- A. 37
- B. 47
- C. 67
- D. 57

Answer

84. If the foot of the perpendicular from (0, 0, 0) to the plane is (1, 2, 2), then the equation of the plane is

```
A. -x + 2y + 8z - 9 = 0

B. x + 2y + 2z - 9 = 0

C. x + y + z - 5 = 0

D. x + 2y - 3z + 1 = 0
```

Answer

85. If P = (0, 1, 2), Q =(4, - 2, 1), O =(0, 0, 0), then \angle POQ is equal to

- A. π2B. π4
- С. пб
- C. III
- D. π3

Answer

86. Wike share pankmark bownload Make Netes Print - Keus Figura with Ruestions Join Munaria as in A,

Mathematics





A. $x^2 + y^2 + z^2 = h^{-2}$ Study, Assignments, Solved Previous Year Papers . Questions and Answers. Free Forever. B. $x^2 + y^2 + z^2 = 4h^{-2}$

C. $x^2 + y^2 + z^2 = 16h^2$

D. $1x^2 + 1y^2 + 1z^2 = 9h^2$

Answer

87. Evaluate $\int -21fx dx$, where f(x) = 1 - 2x, $x \le 01 + 2x$, $x \ge 0$

- A. 0
- B. 2
- C. 4
- D. 6

Answer

88. The area (in square units) of the region bounded by $x^2 = 8y$, x = 4 and X-axis, is

- A. 23
- B. 43
- C. 83
- D. 103

Answer

89. $\int dxxx + 9$ is equal to

- A. 23tan-1x + C
- B. 23tan-1x3 + C
- C. tan-1x + C
- D. tan-1x3 + C

Answer

90. $\int x + 12exdx$ is equal to

A. $xe^{x} + C$

- B. $x^{2}x^{x} + C$
- C. $(x + 1)e^{x} + C$

```
D. (x^{2} + 1)e^{x} + C
```

Answer

- 91. $\int dxa2sin2x + b2cos2x$ is equal to
 - A. labtan-latanxb + C
 - B. tan-latanxb + C
 - C. labtan-lbtanxa + C
 - D. tan-1btanxa + C

Answer

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^{92.} $\int 0\pi 2\sin 8x\cos 2x dx$ is equal to



<u>Β. 3π512</u>

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D. 7π512

Answer

93. $\int -11ax3 + bxdx = 0$ for

A. any value of a and b

B. a > 0, b > 0 only

C. a > 0, b > 0 only

D. a < 0, b > 0 only

Answer

94. Using the Trapezoidal rule, the approximate value of $\int 14y dx$

| х | 1 | 2 | 3 | 4 |
|---|--------|--------|--------|--------|
| У | 0.7111 | 0.7222 | 0.7333 | 0.7444 |

- A. 0.1833
- B. 1.1833
- C. 2.1833
- D. 3.1833

Answer

95. The solution of $xdx + ydy = x^2ydy - xy^2dx$ is

A.
$$x^{2} - 1 = C(1 + y^{2})$$

B. $x^{2} + 1 = C(1 - y^{2})$
C. $x^{2} - 1 = C(1 - y^{2})$
D. $x^{2} + 1 = C(1 - y^{2})$

Answer

96. The solution of $x^2 + y^2 dy dx = 4$ is

A.
$$x^{2} + y^{2} = 12x + C$$

B. $x^{2} + y^{2} = 3x + C$
C. $x^{2} + y^{2} = 8x + C$
D. $x^{3} + y^{3} = 12x + C$

Answer

97. The solution of dydx + y = ex is

A. $2y = e^{2x} + C$ Like. Share. Bookmark. Download. Make Notes. Print - Your Favourite Questions. Join www.zigya.com



D. $2ye^{2x} = 2e^{x} + C$

Answer

98. If y = y = Acosnx + Bsinnx, then $y_2 + n^2y$ is equal to

- A. 0
- B. 1
- С. у
- D. 1

Answer

99. If A, B, C, D are angles of a cyclic quadrilateral, then cosA + cosB + cosC + cosD is equal to

- A. 0
- B. 1
- C. 1
- D. 4

Answer

100. The equation 3sinx + cosx = 4, has

- A. only one solution
- B. two solution
- C. infinitely many solution
- D. No solution

Answer