YASHOTEJ ACADEMY
ENTRANCE EXAM
MATHS

CADET ID : DATE :
TIME : 90 min CLASS : 11TH

1. If $x = r\sin\theta$ and $y = r\cos\theta$ then the value of $x^2 + y^2$ is
   a)r b)r^2
   c)$\frac{1}{r}$ d)1

2. $\frac{1-tan^2 45^0}{1+tan^2 45^0} =$ _____?
   a)$\tan 90^0$ b)1
   c)$\sin 45^0$ d)0

3. If θ is an acute angle and $7 + 4\sin\theta = 9$, then the value of θ will be
   a)90^0 b)30^0
   c)45^0 d)None of these

4. If $\theta = 45^0$ then, $\sec\theta\cot\theta - cosec\,\theta\tan\theta$ is
   a)0 b)1
   c)$2\sqrt{2}$ d)$\sqrt{2}$

5. The value of θ,for $\sin 2\theta = 1, 0^\circ < \theta < 90^\circ$ is:
   a) 60° b)55°
   c)45° d)135°

6. The probability of getting 7 in rolling a fair dice is _____
   a)1 b)0
   c)6 d)8

7. An integer is chosen from the first twenty natural number. The probability of getting a prime number _____
   a)$\frac{8}{20}$ b)$\frac{9}{20}$
   c)$\frac{15}{20}$ d)$\frac{10}{20}$

8. There are 40 cards in a bag. Each bears a number from 1 to 40. One card is drawn at random. What is the probability that the card bears a number which is a multiple of 5 ?
   a)$\frac{1}{5}$ b)$\frac{3}{5}$
   c)$\frac{4}{5}$ d)$\frac{1}{3}$

9. The product of the roots $\alpha\beta =$ _____
   a)$\frac{-b}{a}$ b)$\frac{-c}{a}$
   c)$\frac{b}{a}$ d)$\frac{c}{a}$

10. If $\frac{1}{2}$ is root of the equation $x^2 + kx - \frac{5}{4} = 0$ value of k is _____
    a)2 b)$\frac{1}{2}$
    c)$-\frac{1}{2}$ d)-2

11. What is the solution of the quadratic equation $2x^2 - 7x + 6 = 0$?
    a)$-\frac{3}{2}, 2$ b)$\frac{3}{2}, 2$
    c)$-2, \frac{3}{2}$ d)$2, \frac{2}{3}$

12. The sum of first 16 terms of the A.P 10, 6, 2,..... is _____
    a) –320 b) 320
    c) –352 d) –400

13. For an given A. P. t_6 = 12, d = 3 then a = _____.
    a)3 b)-3
    c)15 d)9

14. In an A.P. 1st term is 1 and the last term is 20. The sum of all terms is 399 then n =_____
    a)42 b)38
    c)21 d)19

15. For an given A.P. $a = 3.5, d = 0, n = 101$, then t_n = _____
a)0 b)3.5
c)103.5 d)104.5

16. Slope of line parallel to y-axis is _____
a) not defined b)1
c)0 d)2

17. P divides segment QR internally in the ratio 2:1. Q = (–5, 8), R = (4, −4) then P =_____
a)(0,1) b)$(0, -1)$
c)(1,0) d)$(-1,0)$

18. The distance of the point $P(-6,8)$ from the origin is
a)8 units b) $2\sqrt{7}$.units
c) 10 units d) 6 units

Statistics

19. The mode and mean is given by 7 and 8, respectively. Then the median is:
a)1/13 b)13/3
c)23/3 d)33

20. The abscissa of the point of intersection of the less than type and of the more than type cumulative frequency curves of a grouped data given its
a)mean b)median
c)mode d)all the three above

21. $\cot\theta + \tan\theta$ equals:
a)$cosec\theta \sec\theta$ b)$\sin\theta \sec\theta$
c)$\cos\theta \tan\theta$ d)$sin^2\theta$

22. If $\sin 2A = \cos 3A$, then correct statement is
a)$A = 100°$ b)$A = 30°$
c)$A = 20°$ d)$A = 18°$

23. If the mean of first n natural number is $3n/5$, then the value of n is:
a)3 b)4
c)5 d)6

24. Find the mean of 10 numbers, where their deviation about 20 is -10.
a) 21 b) 20
c) 19 d) 23

25. If the points (k, 2k) , (3k, 3k) and (3, 1) are collinear then what is the value of k.
a)$\frac{-1}{3}$ b)$\frac{1}{3}$
c)-3 d)3

26. What is the sum of the first 30 natural numbers?
a) 464 b)465
c)462 d)461

27. Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is_____
a) 0 only b) 4
c) 8 d) 0, 8

28. Two dice are thrown simultaneously. The probability of getting a sum of 9 is :
a)$1/10$ b)$3/10$
c)$1/9$ d)$4/9$

29. A number is selected at random from first 50 natural numbers. Then the probability that it is a multiple of 3 and 4 is
a)$7/50$ b)$4/25$
c)$1/25$ d)$2/25$

30. The solution of cos θ = 0 in [0°, 360°] is:
a) 0°, 180° b) 90°, 270°
c) 45°, 225° d) 60°, 300°

31. The perimeter of a circle is also called:
a) Diameter b) Radius
c) Circumference d) Area

32. The value of tan 45° is:
a) 0 b) 1
c) √3 d)Undefined

33. The decimal expansion of a rational number is terminating if the denominator has prime factors:
a) 2 and 3 b) 2 and 5
c) 3 and 5 d) Only 3

34. The coordinates of the origin are:
a) (0, 1) b) (1, 0)
c) (0, 0) d) (1, 1)

35. The value of the discriminant of the equation $x^2 - 5x + 6 = 0$ is:
a) 1 b) 25
c) −1 c) 49

36. The first term of the AP 3, 7, 11, … is:
a) 3 b) 7
c) 11 d) 4

37. If two linear equations have a unique solution, their graphs are:
a) Parallel lines b) Coincident lines
c) Intersecting lines d) Perpendicular lines

38. If two triangles are similar, the ratio of their corresponding sides is:
a) Equal b) Unequal
c) Inverse d) Random

39. The graph of a linear polynomial is a:
a) Curve b) Circle
c) Straight line d) Parabola

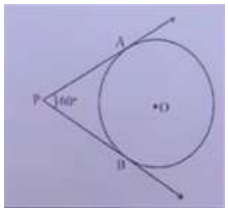
40. The angle of depression is measured from the:
a) Vertical line b) Horizontal line
c) Object d) Ground

41. The maximum volume of a cone that can be carved out of a solid hemisphere of radius r is
a)$3\pi r^2$ b)$\frac{\pi r^3}{3}$
c) $\frac{\pi r^2}{3}$ d)$3\pi r^3$

42. The point on the $x - axis$ which is equidistant from points $(-1,0)$ and $(5,0)$ is
a)$(0,2)$ b)$(2,0)$
c)$(3,0)$ d)$(0,3)$

43. If $A(2,2)$ and $B(-4,-4,)$ and $C(5,-8)$ are the vertices of Δ ABC, then the length of median through vertex C is
a)$\sqrt{117}$ b)$\sqrt{113}$
c)$\sqrt{85}$ d)$\sqrt{65}$

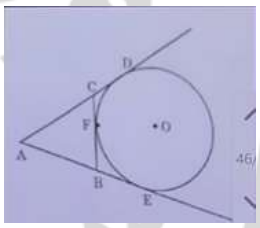
44. In the given figure PA and PB are two tangents drawn to a circle with centre O and radius 5 cm. if $\angle APB = 60°$, then the length of PA is



a)$\frac{5}{\sqrt{3}}cm$ b)$\frac{5}{\sqrt{3}}cm$
c)$\frac{10}{\sqrt{3}}cm$ d)$10\sqrt{3}\ cm$

45. Two cones have their height in the ratio of $1:3$ and radii in the ratio of $3:1$, then the ratio of their volumes is
a) $3:1$ b)$1:3$
c)$2:3$ d)$3:2$

46. AD and AE are tangents to circle with centre O and BC touches the circle at F. if perimeter of Δ ABC is 12cm then AE is



a)6 cm b)5 cm
c)7 cm d)9 cm

47. The value of $k$if the sum of zeroes of the polynomial $x^2 - (k+6)x + 2(2k-1)$ is half of their product is
a) 7 b)11
c)12 d)-12

48. If the roots of quadratic equation $4x^2 - 2x + C^2 = 0$ are reciprocal of each other then the value of C is
a)20 b)-4
c)$+2, -2$ d)$1/2$

49. All queens, jacks and aces are removed from playing cards. The remaining cards are well shuffled and one card is picked up at random from it. The probability of that card to be a king is
a)$1/10$ b)$1/13$
c)$3/10$ d)$3/13$

50. If the centroid of the triangle formed by the points $P(a,b), Q(b,c)$ and $R(c,a)$ is at origin then $a^3+b^3+c^3$ is equal to
a)abc b)0
c)$a+b+c$ d)$3abc$

51. The pair of line represented by the equations $2x+y+3=0$ and $4x+ky+6=0$ will be parallel if parallel if value of k is ____
a) 1 b)-2
c)2 d)3

52. If the mean of a,b,c is M and $ab+bc+ca=0$, the mean of a^2, b^2 and c^2 is KM^2, then K is equal to
a)3 b)9
c)6 d)4

53. Each root of $x^2-bx+c=0$ is decreased by 2. The resulting equation is $x^2-2x+1=0$, then
a) $b=6, c=9$ b)$b=3, c=5$
c)$b=2, c=-1$ d)$b=-4, c=3$

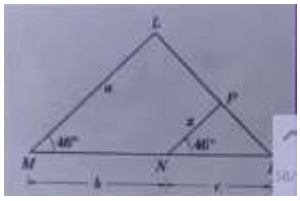
54. If the nth term of an AP is given by $a_n=5n-3$, then the sum of first 10 terms if
a)225 b)245
c)255 d)270

55. The 2 digit number which becomes $\frac{5}{6}$ th of itself when its digits are reversed. The difference in the digits of the number being 1, then the two digits number is
a)45 b)54
c)36 d)none of these

56. If the perimeter of one face of cube is 20 cm, then its surface area is
a)120 cm^2 b)$150cm^2$
c)$125cm^2$ d)$400cm^2$

57. A tree casts a shadow 15m long on the level of ground, when the angles of elevation of the sun is 45°. Find the height of tree.
a) 15m b)10m
c)7.5m d)12m

58. In the given figure x is



a)$\frac{ab}{a+b}$ b)$\frac{ac}{b+c}$
c)$\frac{bc}{b+c}$ d)$\frac{ac}{a+c}$

59. If the roots of the quadratic equation $x^2+(x+1)x+b=0$ are 4 and -3, then $a-b$ is
a)12 b)14
c)7 d)1

60. The radius of wire is decreased to one third. If the volume reaming the same, the length will become
a)3 times b)6 times
c)9 times d)27 times

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