**20/03/2020 Dnyanamitra Academy**

**Time:30 min. Applications of Derivatives Marks: 120**

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1] If the line  touches the curveat (1,-1) then the values of are a) 0,2 b) -2,0 c) 2,0 d) 1,-2

2] For the functiona stationary point is (a) (b) (c) 3 (d)

3] The equation of normal to the curveat is

(a) (b) (c) (d)

4] A stone is thrown up vertically and the *t* seconds is given by The stone reached the maximum height in time (sec.) a) b) 2 c) 3 d)

5] The equation of a curve isnumber of tangents to the curve that

can be drawn parallel to *x-*axis, are (a) 1 (b) 0 (c) 2 (d) 6

6] The radius of a circular blot of ink is increasing at the rate of 3cm/min The rate of increase of its area when the radius is 2cm. is a) b) c)  d)

7) Approximate value of 1004 given that 10 = 2.3026

a) 6.9118 b) 7.9118 c) 4.1118 d) 5.9118

8) The value of a for which the sum of the square of the roots of the equation  is least is a) 0 b) 1 c) 2 d) 3

9) If a particle is moving in a straight line according to the lawthen its displacement when velocity is 9 is a) – 4, 4 b) 4, 0 c) 4, 2 d) – 4, 0

10) f(x) = sin x + cos 2x (x > 0) has minima for x =

a) b) c) d)

11) A wire of length ‘a’ is cut into two parts which are bent respectively in the form of square and a circle. The least value of the sum of the areas so formed is

a) b) c) d)

12) If the sum of lengths of the hypotenuse and another side of a right angled triangle is given, show that the area of the triangle is max. when the angle between these is =

a) b) c) d) –

13) The height of the cylinder of max. volume that can be inscribed in a sphere of radius a is

a) b) c) d)

14) The function dt attains its maximum at x =

a) 1 b) 2 c) 3 d) 4

15) The approximate value of given that radians,  is a) 0.4887 b) 0.8478 c) 0.4880 d) 0.4487 16) The approximate value of is a) b) c)d)

17) If the sand is dropping from a pipe at a rate of 12cm3 per sec. and form a cone whose height is always sixth part of its radius. Then the rate of increase of the height of cone, when height is 4 cm is a) b) c) d)

18) The function is ...... function on R.

a) an increasing b) a decreasing c) a continuous d) a discontinuous

19) The function is ....... in the interval 

a) increasing b) decreasing c) a and b both d) neither increasing nor decreasing

20) If the curve  at which the tangent drawn makes an angle of 600 from X- axis, then the point on the curve is ..... a) b) c) d) 

21) The angle of intersection of the curves  is .......

a)  b) 

c)  d) none

22) The curves  and touch each other at point.....

a) (0,1) b) (1,0) c) ( - 1 , 0) d) (0, -1)

23) The value of x for which the function is maximum or minimum is.....

a) 1 b) - 1 c) 0 d) 2

24) The maximum value of the function  is .......

a)  b)  c)  d) 

25) The height of cylinder of maximum volume, inscribed in a sphere of radius ‘a’ is .....

a)  b)  c)  d) 

26) The height of the right circular cylinder with given total surface area and maximum volume is...

a) equal to the diameter of the base b) equal to the radius of the base

c) equal to the height of cylinder d) none

27) The diameter of a spherical balloon is variable, then the rate of change of its volume with Respect to x is ........ a)  b)  c)  d) none

28) The function  is increasing in the interval …….

a)  b)  c)  d) 

29) The equation of normal to the curve  which makes an angle of 450 from X- axis is ….a)  b)  c)  d) 

30) An angle  where  which increases twice as fast as its sine is …..

a)  b)  c) d)

31) The points at which the tangent to the curve  are parallel to X- axis are

a) b) c) d)

32) The sum of intercepts cut by tangent to the curve  at the point (4,4) on the co-ordinate axes is.... a) 4 b) 6 c)  d) 16

33) Value of Maximum of  is ....... a)  b)  c)  d) 

34) Value of  is maximum at  = ..... a)  b)  c)  d) none

35) The approximate value of (10002)3000 is ..... a) 1.2 b) 1.4 c) 1.6 d) 1.8

36) The total revenue received from the sale of  units of a product is given by The marginal revenue, when  is ..... a) 116 b) 96 c) 90 d) 126

37) The line  is a tangent to the curve, if the value of m is .....

a) 1 b) 2 c) 3 d) 38) The angle between the tangents to the curve at the points where  is.....

a)  b) c) d)

39) The condition that the curves  may cut each other orthogonally is a) b) c) d) none

40) The tangent to the curve, drawn at the points for which  intersect at the point....a)  b) (2,1) c) (0,0) d) none

41) The condition that the line  may be normal to the curve  is.....

a)  b)  c)  d) 

42) The part of the tangent to the curve  included between the co-ordinate axes, is divided by The point of tangency in the ratio .... a) 1 : 1 b) 1 : 2 c) 1 : 3 d) none

43) The curves  cut at right angles if

a)  b)  c)  d) none

44) The equation of the normal to the curve  at  is...

a)  b)  c)  d) none

45) For the curve  the tangent is parallel to  where.....

a)  b)  c) t = 0 d) 

46) The minimum value of  is ...... a)  b)  c) 1 d) none

47) The minimum value of  is ...... a) 1 b) - 1 c) 2 d) none

48) The equation of tangent to the curve  at the point where it cuts the X-axis is ....a)  b)  c)  d) 

49) The maximum value of the function  is ......

a)  b)  c)  d) 

50) The volume of cone, of given slant height is maximum if the semi-vertical angle is

a)  b)  c)  d) 

51) The rectangle inscribed in a circle has maximum area when it is a ......

a) rectangle b) triangle c) square d) circle

52) Prove that the volume of the largest cone that can be inscribed in a sphere of radius R is.... of the volume of sphere. a)  b)  c)  d) 

53) Show that the greatest triangle which can be inscribed in a circle is an ..... a) right angle triangle b) isosceles triangle c) equilateral triangle d) rectangle

54) If the cost price of the production of  items of an object in Rs. is . Then the marginal cost for the production of 17 items is a) Rs.206 b) Rs. 208 c) Rs.204 d) Rs.200

55) the function  is increasing in the interval .......

a)  b) c) d)

56) The equation of normal to the curve  at point t is ..... a)

b)  c)  d) 

57) The equation of normal at point (4,3) for the hyperbola  is .....

a)  b)  c)  d) 

58) A kite is moving horizontally at a height of 151.5m. If the speed of kite is 10m/sec, how fast is the string being let out, when the kite is 250m away from the boy who is flying the kite, if the height of the boy is 1.5 m ? a) 4m/sec b) 6m/sec c) 8m/sec d) 2m/sec

59) The volume of a cube increases at a constant rate. Then its surface area is ......

a) b) c) d)

60) The point at which the slope of the curve  is maximum is .....

a) (1, - 16) b) (- 1 , -16) c) (-1, 16) d) (1,16)