**Dyanamitra Academy**

**24/03/2020                 Applications of Derivatives & Applications of Integration**

**Time : 50 min.    XII (CET) Marks:120**

-------------------------------------------------------------------------------------------------------------------------------------- [1] If, from mean value theorem,,then:

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

[2] If is differentiable for all x and while  for all,then (a)  (b) (c)  (d)

[3] A stone thrown vertically upwards risesft in  seconds where. The maximum height reached by the stone is (a) 192 ft (b) 190 ft (c) 196 ft (d) 392 ft

[4] The radius of a cylinder is increasing at the rate of 3m/sec and its altitude is decreasing at the rate of 4m/sec The rate of change of volume when radius is 4m and altitude is 6m is (a) 144m3/sec (b) 64 m3 / sec (c) 80  m3 / sec (d) - 80 m3 / sec

 [5] Ifwhere, then velocity equals acceleration at time (a) 1 (b) 2 (c) 3 (d) 4

[6] If the rate of change of volume of a sphere is equal to the rate of change of its radius, then the radius is (a) 1 (b)  (c) (d)

[7] A man on the tower 15 metres above the water pulls in a rope attached to a boat, at the rate of 0.8m/sec. When the boat is 8m from the tower, it is approaching the river bank at the rate of (a) 17m/sec. (b) 1.7m/sec. (c) 0.7m/sec. (d) 7m/sec.

[8] A man of height 150cm walks at the rate of 75cm/sec, towards a lighted lamp-post which is 450cm high, When he is 360cm away from the lamp-post, his shadow is shortening at the rate of (a) 37.5 cm/sec. (b) 75.3 cm/sec. (c) 57.3 cm/sec. (d) 3.75 cm/sec.

[9] A ladder 5 m long rests against a vertical wall. If its top slides down at the rate of 10cm/sec, then, when the foot of the ladder is 4m away from the wall, the angle between the floor and the ladder is decreasing at the rate of

 (a) radians/sec. (b)radians/sec. (c) (0.025) radians/sec. (d) radians/sec

[10] When a circular oil drop expands on water, its area increases at the rate ofWhen the radius is 5 cm, it is increasing at the rate of (a) 4 cm/sec. (b) 8 cm/sec. (c) 2 cm/sec. (d) 16 cm/sec.

[11] Slant height of a cone is fixes at 7cm. If its height increases at 0.6cm/sec, then, when the height is 4 cm, its volume is increasing at the rate of

a) b) c) d)

 [12] If the perimeter and area of a square change at the same rate, then side of the square is (a) 2 units (b) 4 units (c) 6 units (d) 3 units

 [13] Radius of base of a cone is increasing at 3cm/min, and its height decreasing at 4cm./min. When the radius is 7cm. and height 24cm, its surface is changing at the rate of (a) 63 (b) 84 (c) 96 (d) 72

[14] If the volume and side of a cube are changing at the same rate, then the side of the cube is (a)units (b)  units (c) units (d) units

[15] If the surface area of a sphere increases at the rate of 2 sq. ft./sec, then, when the radius is 6 ft. its volume is increasing at the rate of (a) 2 cu. ft./sec. (b) 6 cu. ft./sec. (c) 3 cu. ft./sec. (d) -3 cu. ft./sec.

[16] If air is leaking from a spherical balloon at the rate of 2cc/sec, then, when radius is 10cm, its surface area is decreasing at the rate of

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

[17] The area bounded by the curve x2 = – 4y , X- axis from x = 0 to x = 4 is :

a)sq. units b)sq. units c)sq. units d)sq. units [18] The area of circle x2 + y2 =25 is a) 20π Sq. units b) 25π Sq. units c) 16π Sq. units d) 22π Sq. units

[19] Area bounded by the parabola y2 =8x and its latus rectum is:

a)sq. units b) sq. units c)sq. units d)sq. units

[20] The area bounded by the curve y2 = 4 ( x – 1) and the lines x = 1, y = 2 is :

a)sq. units b) sq. units c)sq. units d)sq. units

[21] The area of ellipse is :

a) 22π Sq. units b) 24π Sq. units c) 6π Sq. units d) 12π Sq. units

[22] The area bounded by the parabola y = x2 and the line y = 2x is :

a)sq. units b) sq. units c) sq. units d) sq. units

[23] The area of the region bounded by the curves and X-axis in the first quadrant is a)Sq. units b) 18 Sq. units c) 9 Sq. units d)Sq. units

[24] The area of the region in the first quadrant enclosed by the circleand the line is a) Sq.unit b) Sq.unit c)Sq.units d) Sq.units

25] The area bounded by the curve y = tan-1 x, X-axis and,is :

a)b) c)d)

[26] The area bounded by y = e**-**x, X- axis, x = 0, x = 1 , is:

a)  b) c)  d) 

[27] If the area bounded by the parabola y2 = x , and the line x = 5 is divided into two equal parts by the line x = k, then the value of k = a)  b)  c)  d) 

28) Let  be a polynomial in a real variable x with The function P(x) has

a) neither max, nor min. b) only one max c) only one max and one mini. d) only one minima

29) The function  is: a) increasing in  and decreasing in (-1,1)

b) decreasing in  and increasing in (-1,1)

c) increasing in  and decreasing in  d) decreasing in  and increasing in 

30) Rolle’s theorem is not applicable to the function  in the interval  because

 a) is not derivable in (-3,3) b) c) d) is continuous in (-3,3)

31) There exists a function  satisfying  for all  then

a)b) c) d)

32) Let  a) a decreasing function

b) neither increasing nor decreasing c) an increasing function d) none

33) Rolle’s theorem is applicable in case of 

a) interval  b) any interval c) interval  d) none

34) A particle moves so that the space described in time  is square root of a quadratic function of  then: a) acc varies as s3 b) acc varies as c) acc varies as  d) none

35) A circle of radius unity is inscribed in an isosceles triangle. The least perimeter of the triangle is a)  b) 9 c)  d) 

36) If  where m,n N, then: a) is a point of inflexion

b)  is a point of minima c)  is a point of maxima d) none

37) A point an the parabola  at which the ordinate increases at twice the rate of the abscissa is: a) (2,4) b) (2, -4) c)  d) 

38) If then x lies in the interval: a) (-2, -1) b) (1,2) c)  d)none

39) The area of the triangle formed by the co-ordinate axes and a tangent to the curve

at the point  on it is a)  b)  c)  d)  40) The area bounded between the parabolas :  and and the straight line y=2 is

a)  b)  c)  d)  41) The area (in square units) bounded by the curves  x-axis, and lying

in the first quadrant is a) 36 b) 18 c)  d) 9 42) The area enclosed by the curvesOver the intervala)  b)  c)  d) 

43) 1) If the region is bounded by the curve  and the straight line y=4, then the area of bounded region is a)  b)  c)  c) 

44) If the region is bounded by the circle line  and X-axis, which lies in first quadrant , then the area of the bounded region is

a) b)  c)  d) 

45) If  then area of bounded region is .....

a)  b)  c)  d) 1

46) The curves  divide the area of square bounded by  into ..... equal parts. a) two b) three c) four d) five

47) The area of the region bounded by the line  and the ordinates x = -1 and x=1 is ..... a) b) c) d) 

48) The area bounded by the lines  is ......

a) 6sq.units b) 8sq.units c) 4sq.units d) 2sq.units

49) The area of the region bounded by parabola  and the straight line  is.....

a)  b) 1 sq. unit c)  d) 

50) The area of the region bounded by  and straight line  is ......

a)  b)  c)  d) 

51) The area bounded by the curve  is .....

a) 2 b) 4  c) 12 d) 6

52) The area bounded by the curves  and  is .......

a) 1 sq. units b) 2 sq. units c)  d) 4 sq. units

53) The area bounded by the curvesand  is.....a) 16 b) 28 c) 32 d) 40