MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-15, APRIL-2020  **MATHEMATICS** **TIME: 45Mins MARKS: 30**

**TOPIC**: **APPLICATION OF DERIVATIVES, INTEGRATION, AREAS, DIFFERENTIAL EQUESTION.**

**KEY**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **B** | **C** | **A** | **A** | **B** | **B** | **D** | **A** | **C** | **A** | **C** | **C** | **B** | **A** | **C** |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| **C** | **D** | **C** | **C** | **B** | **C** | **B** | **D** | **B** | **B** | **C** | **A** | **B** | **D** | **C** |

**HINTS AND SOLUTIONS**

1. (b) Motion of a particle 

Therefore, velocity ⇒ and 

Therefore, average .

1. (c) Acceleration  then acceleration after 3 second .
2. (a) Given the rate of increasing the radius  and

Area of circle ,  ⇒ ⇒  ⇒ .

1. (a) For curve  ⇒ ∴ and for curve  ⇒  ∴ 

∴ Angle between the curves is .

1. (b) . Let the coordinates of *P* is (*h*, *k*), then 

Clearly  ⇒  ⇒ ; ∴ *P* is (1, 2).

1. (b) 

 ⇒

 (Maximum value)

and  (Minimum value).

1. (d) 



Here 







Therefore the maximum value of function is 37 at .

1. (a) 

For increasing 

Therefore, the function is increasing for 

Similarly decreasing for .

1. (c) .
2. (a)  
3. (c) 

Put , then it reduce to 



1. (c)   
2. (b) . Put 



; .

1. (a) Putting  and  we get

.

1. (c)  





1. (c) =

Putting  it reduces to

= .

1. (d) Put as and    .
2. (c) Integrate it by parts taking as first function 



On comparing with the given value .

1. (c) **** Since  is positive in interval 

 .

1. (b)  = 

= = 4.

1. (c) ****,****

** **.

1. (b) Let  

 

Applying the formula, we get  

1. (d)  = 

 .

1. (b) Let the ordinate at divide the area into two equal parts



*Y*

(2, 3) *A*

*C*

*X*

*O*

*M*

(2,0)

*D*

(*a,*0)

### N

(4,0)

Area of 

Area of 

On solving, we get ;Since ⇒ .

1. (b) Obviously, triangle *ACB* is right angled at *C*.

(0, 2)*C*

*x =* 2

*A* (2, 0)

*y* = 2 – *x*

*y* = 2+*x*

*B* (2, 4)

*X*

*Y*

∴ Required area *sq*. *unit*.

1. (c) Given equations of curves  and straight line  We know that area of the figure bounded by the curves and straight line



1. (a) Given differential equation, 

In this equation order of highest derivative is 2,

Hence order and degree of highest derivative .

1. (b) Given 

 



. Hence .

1. (d) ⇒ ⇒ 

⇒  ⇒ or .

1. (c)  ⇒ 

At ⇒ ; For .