MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-33, JUNE-2020  **MATHEMATICS**  **TIME: 45Mins MARKS: 30**

**TOPIC**: **2nd PU RELATIONS & FUNCTIONS, MATRICES, DETERMINANTS, CONTINUITY AND DEFFENTIATION, APPLICATION OF DERIVATIVES. DATE: 04/06/2020**

**KEY**

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

**HINTS AND SOLUTIONS**

1. (a) For any, we find that *a*|*a,* therefore *R* is reflexive but *R* is not transitive, because  does not imply that.
2. (c) By verification,  Hence .
3. (b) [*x*] denotes the integral part of *x*. Hence, after term  each term will be one. Hence the sum of given series will be 50.
4. (b)  *i.e.*,   ⇒ ⇒ 

Again  ⇒  ⇒  All these can be combined as  and .

1. (c)  or ⇒  ⇒  ⇒ .
2. (d) For  to be continuous at  we should have 

 

 Hence 

1. (c) ⇒ ⇒...(i)

If then L.H.S.  as  while R.H.S. =1, therefore 

Now from (i), 

. Solving  and  we get .

1. (a) We have, 

Clearly, and . So,  is continuous at 

Now  Here *x* = 0,  while 

and at *x* = 1,  while  Thus,  is not differentiable at *x* = 0 and 1.

1. (a) Given, in   ⇒  ⇒ 

⇒ ⇒ 

⇒ 

Here, sum of squares of three members can be zero if and only if 

⇒  is equilateral ⇒ 

.

1. (a)  =  

= 

{Since .

1. (c) Since  = .
2. (d) ⇒ ****

, then, .

1. (b)    

= .

1. (b) .
2. (d) 





⇒ .

1. (a) If *A* is square matrix of order 3, then .
2. (a)  = 

,

which is clearly negative because of the given conditions.

1. (d) Given, 

Expanding the given determinant, we get  or 

This equation may be written as 

Therefore,  is one of the cube roots of – 1.

1. (d) Here  ⇒

Obviously, it is not derivable at  *i.e.,* in 

Also does not hold for  and [1. 5, 3]

Hence the answer is (d).

1. (b) Here ⇒ ⇒.
2. (a) .
3. (c) Let ⇒ 

Therefore, , 

.

1. (c) We are given that 

When , we get 

Differentiating both sides with respect to *x*, we get

 Putting , we get 

1. (a) ⇒ 

⇒ 

⇒ .

1. (a) Let Putting  we get

 

Now  

1. (c) Here  and ⇒  ⇒ 

.

*C*

*Q*

*x*

*B*

*y*

4.5

1.8

*P*

*A*

1. (b) According to the figure

**** ⇒ ****

 Required rate of length of shadow .

1. (d) ,

For maxima and minima,⇒ 

⇒ Either or or  At and

 is maximum at .

1. c) Let  ⇒ 

Now  ⇒  ⇒  ⇒ 

Now  is –*ve* at  ∴Maximum value of = .

1. (a) Given curve  …..(i)

Differentiate with respect to *x*,  ⇒ 

For given line, slope of tangent 

 ⇒ 

From equation (i),  ⇒.