MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-14, APRIL-2020  **MATHEMATICS** **TIME: 45Mins MARKS: 30**

**TOPIC**: **SETS, RELATIONS, FUNCTIONS, LIMITS, CONTINUITY, DIFFERENTIATION.**

**KEY**

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

**HINTS AND SOLUTIONS**

1. (c) *B* ∪ *C* = {*c*, *d*} ∪ (*d*, *e*} = {*c*, *d*, *e*}

 *A* × (*B* ∪ *C*) = {*a*, *b*} × {*c, d, e*}

= {(*a, c*), (*a, d*), (*a, e*), (*b, c*), (*b, d*), (*b, e*)}.

1. (a) , .

∴.

1. (a) Minimum value of 

.

1. (d) Here 

and given 

∴

.

1. (b) For any , we have Therefore the relation *R* is reflexive but it is not symmetric as (2, 1)  but (1, 2) . The relation *R* is transitive also, because  imply that and which is turn imply that .
2. (a) Since , ∴ 

∴ *R* is reflexive.

Also ⇒  ⇒  ⇒,

∴ *R* is symmetric.

 and  need not imply .Hence, *R* is not transitive.

1. (c) Now let  ⇒ 

⇒  ⇒ 

⇒ .

1. (b) ,

,

 ⇒ 

.

1. (d) 





; .

1. (a)  ⇒ 

⇒ 



∴ 

1. (c) .
2. (b) We have  …..(i)

From (i), clearly  is defined for those values of *x* for which 

⇒ 

⇒  ⇒ 

Hence domain of the function is [1, 4].

1. (b)  Range 
2. (a) Let  ⇒  ⇒ 

⇒  ⇒ .

1. (b) .
2. (a) 
3. (b)  
4. (b) 



1. (a)  and .
2. (d) Let 

Now applying L-Hospital’s rule, we have 

1. (d) Let , 

Applying L-Hospital's rule,

, 



.

1. (a) 



.

1. (d)  

Hence  .

1. (c)  .
2. (d) Since  Therefore, at   ⇒.
3. (a)  .
4. (c) .
5. (a)  ⇒  , .
6. (b)  .
7. (d)  and 

 ⇒ .