MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-31, MAY-2020  **MATHEMATICS**  **TIME: 45Mins MARKS: 30**

**TOPIC**: **1st ALGEBRA, LIMITS. DATE: 31/05/2020**

**KEY**

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

**HINTS AND SOLUTIONS**

1. (a) The number of non- empty subsets =  .
2. (b) will meet, when ⇒ 

∴ *A* and *B* meet on (0, 1), ∴ .

1. (c) Check for .... it is true for all .
2. (a)  is always contain equal odd power. So it is always divisible by .
3. (a) Let the coefficient of three consecutive terms *i.e.*  in expansion of  are 165,330 and 462 respectively then, coefficient of  term 

Coefficient of (*r* + 2)*th* term  and

Coefficient of (*r* + 3)*th* term ∴ 

or  or and 

or  or  or 

or  or *n* = 11.

1. (d) 
2. (b) We know that 

Putting *n*=15, then .

1. (c) Solving and , we get .

2*x+*3*y=*6

*x+*4*y=*4

(3,0)

(4,0)

(0,1)

(0,2)

*Y*

*X*

(12/5, 2/5)

*O*

Hence a vertex is .

1. (c) The shaded area is the required area given in graph as below.

*x =y*

*y =x*+3

*X*

*Y*

*O*

Hence it is in I, II and III quadrant.

1. (d) The required number of points

 

1. (c) Since 

Hence, number of divisors .

1. (a) 12 persons can be seated around a round table in  ways. The total number of ways in which 2 particular persons sit side by side is . Hence the required number of arrangements .
2. (a) A number between 5000 and 10,000 can have any of the digits 5, 6, 7, 8, 9 at thousand's place. So thousand's place can be filled in 5 ways. Remaining 3 places can be filled by the remaining 8 digits in  ways. Hence required number = .
3. (c) Given that , therefore







1. (c)  will be purely imaginary, if the real part vanishes*, i.e.,* 

⇒  (only if  be real)

⇒  ⇒ 

1. (a)   or 
2. (c) ⇒ 

Let  then ⇒ 

Hence (by ).

1. (b) 

Cubing both sides, we get

 ⇒ .

1. (c) Suppose that required numbers are  and .

Now A.M. and G.M.

Under conditions,

A.M.=G.M.+ 2  ......(i)

and  .....(ii)

From (ii) and (i), we get  and .

1. (d) Putting  

On checking, (d) is the correct option.

1. (c) Obviously  = .
2. (d) Applying L-Hospital’s rule, 

Again applying L-Hospital’s rule, .

1. (c)   .
2. (c)  .
3. (d) ,  Applying L-Hospital’s rule, , 

 .

1. (c) 

.

1. (a) .
2. (d) Applying L-Hospital’s rule, .
3. (c)  .
4. (d) Without any restriction the 10 persons can be ranked among themselves in  ways; but the number of ways in which  is above  and the number of ways in which  is above  make up . Also the number of ways in which  is above  is exactly same as the number of ways in which  is above .

Therefore the required number of ways .