MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-11, APRIL-2020  **MATHEMATICS**  **TIME: 45Mins MARKS: 30**

**TOPIC**: **MATRICES, DETERMINANTES, COMPLEX NUMBERS, QUADRATIC EQUATIONS, SEQUANCE AND SERIES, L.P.P, LINEAR INEQUALITIES, M.REASONING.**

**KEY**

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

**HINTS AND SOLUTIONS**

1. (b)

*X*

*Y*

## O

## C

*y*=1

*x*+*y*=8

(0, 2)

(7, 1)

(3/2, 1)

(0, 8)

Obviously, at  and (0, 2), *Min*.

1. (d) The shaded region represents the bounded region.

*y–*5*x*=0

*x*=3

(5/2,7/2)

*x–y=*–1

(0,1)

(1,0)

(3,3)

*x+y=*6

*X*

(6,0)

(0,6)

*Y*

*O*

Now, we get the maximum value of *z* at vertex (3, 3). So *Max*.

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 .

(40,0)

(0, 40)

(60,0)

*X*

*Y*

(20,20)

*x+y=*40

*x+*2*y=*60

(0,30)

*O*

1. (d) Obviously,  will be maximum at 

∴ *Max*= .

1. (d) .
2. (b) *p* : A number is a prime.

*Q* : It is odd.

We have *p* ⇒ *q*

The inverse of *p* ⇒ *q* is 

*i.e.*, If a number is not a prime then it is not odd.

1. (b) Let 

⇒  (on simplification)

⇒ 

But the value of the given expression cannot be negative or less than 2, therefore  is required answer.

1. (b) Since the roots  are real.

∴ or 

⇒ 

1. (d) 

  ⇒ 



.

1. (c) Let , then its conjugate 

Given that 

⇒ ⇒ 

If  then and if then 

1. (b) ****



1. (c) Suppose that first term and common difference of A.P.'s are and *D* respectively.

Now,  term  …..(i)

term  ......(ii)

and  term  …..(iii)

So, 



.

1. (d) ****



 

   .

1. (a)  ⇒ 

⇒ ⇒ ⇒ .

1. (a) We have 







.

1. (a) (Infinite G.P.)

 or *i.e.*, .

1. (a) Obviously, on putting , we observe that the determinant becomes



  is a root of the given equation.

1. (d)  
2. (d) 

=,

=  

= 

= 

=  , .

1. (b) ****

**= **

**= {**Applying 

****

**= .**

Hence  is divisible by  as well as by *x*.

1. (b) ****⇒ 

⇒⇒ 

⇒ ⇒ or   or 

 (As given in question)

So,  *i.e*, are in G.P.

1. (d) The given system of homogeneous equations has a non-zero solution if, 

*i.e*., ,*i.e*. if .

1. (a) The system will have anon-zero solution, if

 by 

⇒ (expanding along ) ⇒ .

1. (a) 
2. (b) (As given)

 or .

1. (a) Here  and 

Since therefore .

1. (b)  ⇒ .
2. (b) =  ⇒=

Here,⇒ .

1. (a) 

  

1. (d)  

*B* = *adj*

*adj* and 

*C* =*adj B;*  = |*adj* *B*|; ∴ =1.