MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-28, MAY-2020  **MATHEMATICS**  **TIME: 45Mins MARKS: 30**

**TOPIC**: **COMPLEX NUMBERS, QUADRATIC EQUESTION, SEQUENCE & SERIES. DATE: 25/05/2020**

**KEY**

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

**HINTS AND SOLUTIONS**

1. (c) Given numbers are

and 

∴ ⇒  ⇒ 

⇒  .....(i)

Now  ⇒  ....(ii)

From (i),  ⇒ 

or 

∴ or .

1. (c) First deduce that , then it will be equal to .
2. (d) **Trick :** On checking the options, (d) satisfies both the conditions.

*X*

*O*

*Y*

*θ*1

15

15

*Z*1

*Z*2

25

*θ*2

*θ*1

1. (b) We have

max *amp(z*)=*amp*min *amp* (*z*)=*amp*

Now 



∴   

1. (a) We have and 

Therefore and 

Now 

= 0 (Argument of positive real number is zero).

1. (c) Given that *arg* *zw* = .....(i)



From (i), *arg*

 ; 

; 

1. (d) Since 

Put , on both the sides, we get

.....(i)

Also,  in amplitude modulus form

⇒  ....(ii)

Equating the real parts in (i) and (ii) we get,



1. (c) 







1. (d) We have



 when   )

1. a)  

=  =  = = 

=  = .

1. (d) We have,

 

****

****

Hence least positive integral value of *m* is 3.

1. (c) We have and 

∴ 

⇒  ⇒ 

⇒ 

1. (c) Given equation is 

So,  and 

Now,  

⇒ 

which is minimum for .

1. (a) Given equation 

If , ∴ equation is  ⇒  ⇒  ⇒ 

If , ∴ equation is 

⇒  ⇒  ⇒ 

Hence product of all possible real roots = – 9.

1. (c)  and 

So . If .

If  we have  ⇒ .

1. (c) 

 

 …..(i)

Now,  

 

 .

1. (d) ,  and ,

⇒ , 

 and  ⇒ .

1. (a) Let the roots are *α* and 2*α* ⇒  and 

⇒  ⇒ 

⇒ .

1. (a) As given, ⇒ equation can be written as 

⇒  ⇒  (repeated root)

This must be the common root by hypothesis.

So it must satisfy the equation ⇒  ⇒ 

⇒ are in A.P.

1. (d) Given equations are  ……(i)

and  ……(ii)

Subtracting (ii) from (i), we get ⇒  ⇒ either  or 

When the two equations are identical. So, we take  which is the common root of the two equations. Substituting  in (i), we get 

1. (c) It will take 10 years for Jairam to pay off Rs. 10000 in 10 yearly installments.

 He pays 10% annual interest on remaining amount

 Money given in first year



Money given in second year = 1000 + interest of (10000 – 1000) with interest rate 10% per annum 

Money paid in third year = Rs. 1800 etc.

**So money given by Jairam in 10 years will be Rs. 2000, Rs. 1900, Rs. 1800, Rs. 1700,....,** **which is in arithmetic progression, whose first term** **and** 

Total money given in 10 years = sum of 10 terms of arithmetic progression

= Rs. 15500

Therefore, total money given by Jairam



1. (d) Given 



On multiplying 

Hence 

Area of 



But etc.



1. (a) Here  and , then 



1. (d) ****    

( In an A.P. the sum of the terms equidistant from the beginning and the end is same and is equal to the sum of first and last term)

.

1. (c) Let *a – d, a, a* + *d* be the roots of the equation 

Then  and 

⇒ and 

⇒  and 

⇒ .

1. (a) ****

 To be its minimum .

1. (c) Since  form an increasing G.P., so where .

On solving ,

we get .

Also .

Hence 

Similarly from , we get



Substituting these values of  in  and simplifying, we get .

**Trick :** Check the alternates; only (c) satisfies the condition.

1. (c) Given that 





 .

1. (d) 

⇒ ⇒ .

1. (b) 

   

As  *i.e.,*   



*i.e,*  .