MASTER’S P.U COLLEGE, HASSAN, 573201.

KCET ONLINE TEST-13, APRIL-2020  **MATHEMATICS** **TIME: 45Mins**

**TOPIC**: **TOTAL GEOMETRY INCLUDING 3D. MARKS: 30**

**KEY**

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

**HINTS AND SOLUTIONS**

1. (b) Slope =. Hence equation is .
2. (a) The equation of lines passing through (1, 0) are given by . Its distance from origin is .

⇒  ⇒ . Hence the lines are  and .

1. (b) If the given lines represent the same line, then the length of the perpendiculars from the origin to the lines are equal, so that   .
2. (a) By the help of given condition of , the three lines reduce to  or . All these lines are parallel. Hence they do not intersect in finite plane.
3. (c)  or , .
4. (b) Check by options.

From option (a), 

From option (b), .

1. (a) Let  be the reflection of  in the line .

Then the mid-point  lies on . ∴ ......(i)

Also is perpendicular to . Therefore  .....(ii)

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

1. (d) See condition for circle and also condition for circle to pass through origin *i.e.* origin satisfies equation of circle or .
2. (b) There are only two circles (as shown in figure).

*y=b*

*y=a*

*X*

*Y*

*x=*0

1. (c)  as perpendicular from centre on line = radius.
2. (b) Normal passes through centre, therefore .
3. (a) Let the point be (2,*y’*), then 

Hence the required tangents are .

1. (a)  for orthogonal cut..
2. (d) Here  and ⇒  ⇒ .
3. (d) According to the condition, .
4. (b) .
5. (d) . Also ⇒ 

Hence the length of minor axis is .

1. (b) ⇒

Hence and ⇒

1. (b) .
2. (a)  and  or  ⇒ , .

Hence the required equation of hyperbola is  ⇒ .

1. (c) .
2. (d) Clearly  and  = , 
3. (b) For *xy*-plane,  .
4. (d) Since  Hence lines are intersecting at right angles.
5. (c) 



⇒ .

1. (c) Lines are perpendicular if  Hence, .
2. (c) Equation of a plane parallel to *xy*-plane is *z* = *k *.
3. (b) Given, equaiton of plane is passing through the point (–1, 3, 2)

  .....(i)

Since plane (i) is perpendicular to each of the planes  and 

So,  and 

 

⇒ 

Put the values of *A*, *B* and *C* in (i)

we get, , which is the required equation of the plane.

1. (a) Point (4, 2, *k*) should lie in the given plane

⇒ 