Total No. of Printed Pages:2

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SUBJECT CODE NO:- 2055
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. F.Y (Sem-II)
Examination March/April-2022 (To Be Held In June/July-2022)
Mathematics MAT - 202
(Geometry)

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[Time: 1:53 Hours]   **[Max. Marks:50]**

<div align="center">Please check whether you have got the right question paper.</div>

N.B
        1) Attempt all questions.
        2) Figures to the right indicate full marks.

Q.1   A) Attempt any one   08
        a) Find the perpendicular distance of the point p(x,y,z) from the plane lx+my+nz=P

        b) Find the condition for the line $\frac{x-x_1}{l}=\frac{y-y_1}{m}=\frac{z-z_1}{n}$ to lie in the plane ax+by +cz+d=0

    B) Attempt any one   07
        c) Find the length of the perpendicular from the point (5,4,-1) to the line $\frac{x-1}{2}=\frac{y}{9}=\frac{z}{5}$

        d) Find the bisector of the angle between the plane 3x-6y+2z+5=0, 4x-12y+3z-3=0

Q.2   A) Attempt any one   08
        a) Show that the shortest distance between two lines lies along the line meeting them both at right angles.
        b) Show that the locus of the point of intersection of two spheres is a circle.

    B) Attempt any one   07
        c) Find the equation of the line which passes through the point (-4,3,1) is parallel to the plane x+2y-z=5 and intersect the line $\frac{-(x+1)}{3}=\frac{(y-3)}{2}-\frac{-(z-2)}{1}$ find also the point of intersection.
        d) Obtain the equation of the sphere described on the join of the point A(2,-3,4) B(-5,6,-7) as diameter.

Q.3   A) Attempt any one   05
        a) Find the equation of the right circular cone whose vertex is the point (α,β,γ) and whose axis is the line $\frac{x-\alpha}{l}=\frac{y-\beta}{m}=\frac{z-\gamma}{n}$ and semi vertical angle θ.
        b) Find the point of intersection of the line $\frac{x-\alpha}{l}=\frac{y-\beta}{m}=\frac{z-\gamma}{n}$ with the central coinicoid $ax^2+by^2+cz^2=1$

    B) Attempt any one   05
        c) Find the equation of the sphere through the four points (0,0,0) (-a,b,c) (a,-b,c) (a,b,-c) and determine its radius.

<div align="center">1</div>

d) Find the equation to the tangent planes to $7x^2-3y^2-z^2+21=0$ which pass through the line. $7x-6y+9=0$, $z=3$

Q.4   Choose the correct alternatives   10

1) The angle between the planes $2x-y+z=6$, $x+y+2z=7$ is
   a) $\cos^{-1}\left(4/\sqrt{21}\right)$ b) $\pi/3$ c) $\pi/4$ d) $\pi/2$

2) The number of arbitrary constant in the equations of a straight line is ----------
   a) 6   b) 4   c) 2   d) 0

3) Centre of the sphere $x^2+y^2+z^2+2x+2y-2z+3=0$ is ---------
   a) (1,1,1)   b) (-1,1,1)   c) (-1,-1,1)   d) (1,1,-1)

4) The centre of the sphere which passes through (a,0,0) (0,b,0) (0,0,c) and (0,0,0) is -------
   a) $\left(a/2,0,0\right)$ b) $\left(0,b/2,0\right)$ c) $\left(0,0,c/2\right)$ d) $\left(a/2,b/2,c/2\right)$

5) Guiding curve of a right circular cylinder is -----------
   a) Ellipse   b) circle   c) pair of straight lines   d) any closed curve