SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Mathematics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - III
**20UMACT3006 - Three Dimensional Geometry**

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

## Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Find the angle between the planes $2x - y + z = 6, x + y + 2z = 3$.
2. Find the equation of the plane through the point (1,-2,3) and the intersection of the planes $2x - y + 4z = 7$ and $x + 2y - 3z + 8 = 0$
3. Find the symmetrical form of the equations of the line of intersection $x + 5y - z - 7 = 0, 2x - 5y + 3z + 1 = 0$
4. Find the equation of the sphere which has its centre at the point (6,-1,2) and touches the plane $2x - y + 2z - 2 = 0$
5. Explain about cone and Right circular cone.
6. Find the equation of the sphere having the circle $x^2 + y^2 + z^2 - 2x + 4y - 6z + 7 = 0, 2x - y + 2z = 5$ as a great circle.
7. Show that the equation of a right circular cone whose vertex is O, axis OZ and semi-vertical angle $\alpha$ is $x^2+y^2=z^2\ tan^2\alpha$.
8. Determine the equation of a right circular cylinder of radius 3 with axis $\frac{x+2}{3} = \frac{y-4}{6} = \frac{z-1}{2}$

## Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Find the equation of the plane passing through the points (2,5,-3), (-2,-3,5) and (5,3,-3).
10. Find the shortest distance between the lines $\frac{x-3}{-1}=\frac{y-4}{2} = z + 21$; $\frac{x-1}{1} = \frac{y+7}{3} = \frac{Z+2}{2}$

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11. Determine the equation of the sphere which passes through the circle $x^2+y^2+z^2-2x-4y=0$; $x+2y+3z=8$ and touches the plane $4x+3y=25$.
12. Prove that the equation $7x^2+2y^2+23^2-103x+10xy+26x-2y+2z-17=0$ represents a care whose vertex is (1,-2,2).
13. Find the equation of the right circular cylinder described on the circle through the points
(a,0,0), (0,a,0), (0,0,a) as a guiding curve.

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