

SEMESTER	II	QP CODE	23MAT22
----------	----	---------	---------



P.R. GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA
SEM END EXAMINATIONS APRIL -2025

I B.SC : MATHEMATICS: CORSE 4-ANALYTICAL SOLID GEOMETRY & PROBLEM SOLVING SESSION

TIME: 2 HRS

DATE & SESSION	25.04.2025 & FN	REG NO	024MAT16	MAX MARKS	50
----------------	-----------------	--------	----------	-----------	----

SECTION - I

Answer any **THREE** questions by attempting at least One question from each section
3×10= 30M

PART - A

1. A variable plane is at a constant distance $3p$ from the origin and meets the axes in A,B,C. Show that the locus of the centroid of ΔABC is $x^2+y^2+z^2 = P^2$
2. Prove that the line $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$, $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ are coplanar. Also find their point of intersection and the plane contains the lines.
3. Find length and equation S.D between the lines $\frac{x-2}{2} = \frac{y-3}{4} = \frac{z-4}{5}$, $\frac{x-1}{2} = \frac{y-2}{3} = \frac{z-3}{4}$

PART - B

4. Find the pole of the plane $x+2y+3z=7$ w.r.t the sphere. $x^2+y^2+z^2-2x-4y-6z+11 = 0$
5. Find the limiting points of the coanal system of spheres determined by $x^2+y^2+z^2+4x-2y+2z+6=0$, $x^2+y^2+z^2+2x-4y+2z+6=0$
6. Find the equation the right circular cone whose vertex is $(1,-2,-1)$, axis line $\frac{x-1}{3} = \frac{y+2}{4} = \frac{z+1}{5}$ and semi vertical angle 60° .

SECTION - II

Answer any **FOUR** Questions.

4×5=20M

7. Show that the equation of plane passing through the point $(2,2,-1)$ $(3,4,2)$ $(7,0,6)$ is $5x+2y-3z-17=0$.
8. Find the image of the point $(2,-1,3)$ in the plane $3x-2y+z=9$
9. Find the center and radius of the circle $x^2+y^2+z^2-2y-4z-11=0$
10. Find the pole of the plane $x-y+5z-3=0$ w.r.t. the sphere $x^2+y^2+z^2-15=0$, $x^2+y^2+z^2=9$
11. Show that the spheres $x^2+y^2+z^2+6y+2z+8=0$, $x^2+y^2+z^2+6x+8y+4z+20=0$ are orthogonal.
12. Find the equation of the cone whose vertex is $(1,2,3)$ and base curve $y^2=4ax$, $z=0$
13. Find the enveloping cone at the $(1,1,1)$ and generators touching the sphere $x^2+y^2+z^2-2x+4z-1=0$.