United International **University**
School of Science and Engineering
Assignment-1(Mid Term Exam) Trimester: Summer2024
Course Title: Coordinate Geometry and Vector Analysis
Course Code: Math 2201
Submission deadline: 2 Weeks

---

1. Let $\boldsymbol{L_1}$ and $\boldsymbol{L_2}$ be the lines

$\boldsymbol{L_1}$: $\boldsymbol{x = -5 + 2t,\quad y = -2 + 6t,\quad z = 3 - 2t}$

$\boldsymbol{L_2}$: $\boldsymbol{x = -2 + t,\quad y = -4 + t,\quad z = -3 + 2t}$

i) Are the lines parallel?

ii) Do the lines intersect?

iii) Find the distance between lines?

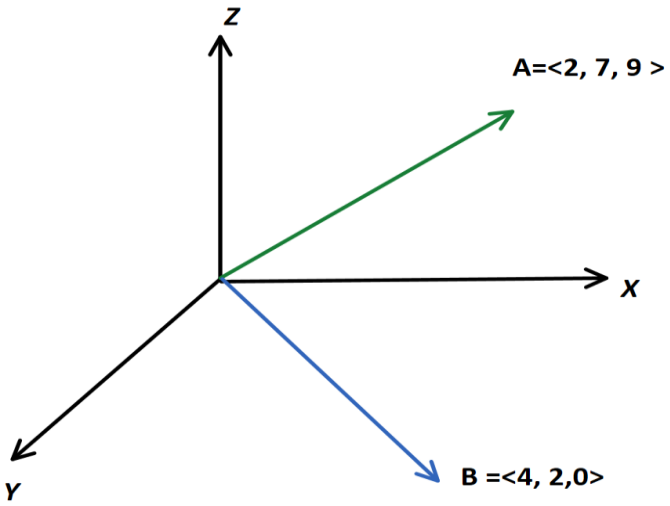
iv) Find the intersection point of the line $\boldsymbol{L_1}$ and the plane $\boldsymbol{x - 5y + 2z = 0}$.

2. **a)** Find the vector component (orthogonal projection) of $\boldsymbol{u} =< -4, -1, 0 >$ along $\boldsymbol{w} =< 2, 0, 1 >$ and orthogonal to $\boldsymbol{u}$.

b) Find the equation of the plane passing through the points $\boldsymbol{p_1(1, -2, 3)}$, $\boldsymbol{p_2(3, 1, -2)}$ and $\boldsymbol{p_3(-2, 3, 1)}$.

c) Determine whether the vectors lie in the same plane $\boldsymbol{p} =< 1, 5, 0 >, \boldsymbol{q} =< -2, 0, 6 >, \boldsymbol{r} =< 0, -7, 1 >$.

3.



I. Find the orthogonal projection of $\boldsymbol{B}$ along $\boldsymbol{A}$.

II. Find the angle between vector **A** and **y**-axis.

III. Find a unit vector that is orthogonal to vector **A** and x-axis.