United International University
School of Science and Engineering
Mid Term Exam Trimester: Spring 2024
Course Title: Coordinate Geometry and Vector Analysis
Course Code: Math 2201 Marks: 30
Total Time: 1 hour and 30 minutes

Answer all questions.

1.	Let L_1 and L_2 be the lines L_1: $x = 5 + 2t,\ y = -2 + 6t,\ z = 3 - 2t$ L_2: $x = -2 + t,\ y = 4 + t,\ z = 3 + 2t$ **i)** Are the lines parallel? **ii)** Do the lines intersect? **iii)** Find the distance between lines? **iv)** Find the intersection point of the line L_1 and the plane $x - y + 2z = 0$.	[10]
2.	**a)** Find the vector component (orthogonal projection) of $u =< 4, -1, 0 >$ along $w =< 2, 0, -1 >$ and orthogonal to u. **b)** Find the area of the triangle with vertices $A(0, 6, -3)$ $B(1, 0, 2)$ and $C(1, -4, 1)$. **c)** Evaluate the double integral $\int_0^{ln3} \int_0^1 xye^{x^2y} dxdy$	[4] [3] [3]
3.	**a)** Evaluate $\int_1^5 \int_x^{x^2} \int_0^{lnz} xe^y\ dydzdx$ **b)** Use a double integral to find the area of region bounded by the lines $x + y = 3,\ y = x + 3$ and $y = 5$.	[5] [5]