Q:1 The distance of the point $(3, -1, 4)$ from the line $x = 4 - t, \;\; y = 3 + 2t, \;\; z = -5 + 3t$ is:

(A) $\dfrac{9\sqrt{42}}{7}$

(B) $\dfrac{9}{7}$

(C) $\dfrac{\sqrt{42}}{7}$

(D) $\dfrac{1}{2}$

(E) 100

Q:2 The limit $\lim\limits_{(x,y)\to(0,0)} \dfrac{2x + 4y}{\sqrt{9 - x - 2y} - 3}$

(A) -12

(B) 6

(C) 12

(D) -1

(E) Does not exist

Q:3 Let $w = \ln(x^2 + y^2 + z^2)$, where $x = ue^v \sin u$, $y = ue^v \cos u$, $z = ue^v$.

The value of $\dfrac{\partial w}{\partial u}$ at $u = -2, \;\; v = 0$ is

(A) -1

(B) 1

(C) 2

(D) -2

(E) 3

Q:4 The directional derivative of $f(x, y, z) = \sin(xy) + e^{yz} + \ln(xz)$ at $P(2, 0, 3)$ in the direction of $\vec{u} = 2\hat{i} - \hat{j} + 2\hat{k}$ is equal to:

(A) $-\frac{10}{9}$

(B) $-\frac{10}{3}$

(C) $\frac{9}{10}$

(D) -2

(E) 1