Quiz- 25

Q.1 Which pairs are orthogonal among the following vectors $v_1=(1,2,-2,1)$, $v_2=(4,0,4,0)$, $v_3=(1,-1,-1,-1)$, $v_4=(1,1,1,1)$?

(A) (v_1, v_2), (v_1, v_3) (B) (v_1, v_3), (v_1, v_4) (C) (v_1, v_3), (v_2, v_3) (D) (v_1, v_2), (v_1, v_4)

Q.2 If P_1 matrix projects any vector onto the line through $a=(1,3)$ and P_2 matrix projects onto the line perpendicular to a, then P_1P_2 is a which type of matrix.

(A) any diagonal matrix of order 2 (B) identity matrix of order 2 (C) zero matrix of order 2

(D) any nonzero matrix of order 2

Q.3. What multiple of $a=(1,1,1)$ is closest to $b=(3,6,6)$?

(A) 3 (B) 4 (C) 5 (D) 6

Q.4 Find the least square solution of $ax=b$, where $a=(1,1,1)$ and $b=(1,2,3)$.

(A) 1(B) 2(C) 3(D) 4

Q.5 What the formula for the projection matrix that projects b onto the column space of A of the system $Ax=b$.

(A) $A(A^TA)^TA^{-1}$ (B) $A(A^TA)^{-1}A^T$ (C) $A^{-1}(A^TA)^{-1}A^T$ (D) $A^T(A^TA)^{-1}A^{-1}$