	**Parul University** **Faculty of Engineering & Technology** **Department of Applied Sciences and Humanities** **1st Year B. Tech Programme (Mathematics and Computing)** **Linear Algebra - 03161151** **Unit–2 Vector Space(Tutorial-2)**
Q-1.	Determine whether the set R^+ of all positive real number with operations $x + y = xy$ and $kx = x^k$ is a vector space.
Q-2.	Check whether $V = R^2$ is a vector space with respect to $(x_1, y_1) + (x_2, y_2) = (x_1 + x_2 - 2, y_1 + y_2 - 3)$ and $k(x, y) = (kx + 2k - 2, ky - 3k + 3)$, k is a real number.
Q-3	Check whether $V = R^2$ is a vector space with respect to $(x_1, y_1) + (x_2, y_2) = (x_1 + x_2 - 1, y_1 + y_2 + 4)$ and $k(x, y) = (kx + 3k + 1, ky - 2k - 4)$, k is a real number.
Q-4	Show that $W = \left\{\begin{bmatrix} a & b \\ c & d \end{bmatrix} / a + b + c + d = 0\right\}$ is a subspace of M_{2X2}.
Q-5	Check whether $W = \{a_0 + a_1x + a_2x^2 + a_3x^3 \mid a_0 = 0\}$ is a subspace of polynomial space or not.
Q-6	Given the vectors $v_1 = (1,0,1), v_2 = (0,1,1), v_3 = (1,1,1)$ in R^3. Determine whether the set Span$\{v_1, v_2, v_3\}$ is a subspace of R^3.
Q-7	Show that $W = \{(x, y): x = -y\}$ is a subspace of R^2.
Q-8	Let $V = R^3$ and consider the set $S = \{(1,2,3), (2,5,7), (0,0,1)\}$. Determine whether S spans R^3. Justify your answer with proper reasoning.
Q-9	Find the span of the vectors $v_1 = (2, 3)$, $v_2 = (-1, 4)$, and $v_3 = (1, -7)$ in R^2. Are these vectors linearly independent?
Q-10	Determine whether the vector v = (5, -3, 1) is in the span of the set {(1, 0, 2), (0, 1, -1)}. Show your calculations.