King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 260 – Term 172 – Quiz 2

Name:

Student ID #:

Question 1. Determine whether the set $\{(x, y, z) \in \mathbb{R}^3| \ xyz = 0\}$ is a vector space.

Question 2. Find a basis and the dimension of the solution space of the homogenous linear

system $\begin{cases} 2x_1 + x_2 - x_3 + 2x_4 = 0 \\ 3x_1 + 4x_2 + x_4 = 0 \\ x_1 + 5x_2 + 2x_3 + 6x_4 = 0 \\ 5x_1 + 2x_2 - x_3 - x_4 = 0 \end{cases}$.

QUESTIONS 3 AND 4 ARE ON THE BACK OF THE PAGE.

Question 3. Determine whether $S = \{(-1, 2, 0, 0), (2, 0, -1, 0), (3, 0, 0, 4), (0, 0, 5, 0)\}$ is a basis for $\mathbb{R}^4$.

Question 4. Find the rank of the matrix $\begin{bmatrix} 2 & 4 & -3 & -6 \\ 7 & 14 & -6 & -3 \\ -2 & -4 & 1 & -2 \end{bmatrix}$.