Note: *All questions are compulsory. Marks are indicated against each question in square brackets.*

Q1.   Max $3X_1 + 4X_2$ [CO2]

Such that, $2X_1 + 3X_2 \geq 8$

$5X_1 + 2X_2 \leq 12$

[5]

Q2.   Max $4X_1 + 3X_2$

Such that, $2X_1 + 3X_2 \leq 8$

$3X_1 + 2X_2 \leq 12$ [CO2]

Does this Linear programming problem face degeneracy   [5]

Q3. Explain the fundamental theorem of LPP.

OR   [CO1]

Prove that S = $\{(X_1, X_2) | X_1^2 + X_2^2 \leq 1 \}$ is a convex set   [5]