6th-Sem-Internal Question for the Department of Mathematics (Kandi Raj College) – 2022

Question Paper for Program course students:

Marks distribution: DSE- 02 =10;

SEC-04 = 05 [ONLY FOR STUDENTS OPTING FOR MATHEMATICS AS SEC]

DSE – 02 [10]

1. Define convex hull and convex set. [1]

2. Show that although (2,3,2) is a feasible solution to the system of equations [3]
$x_1 + x_2 + 2x_3 = 9$
$3x_1 + 2x_2 + 5x_3 = 22$
$x_1, x_2, x_3 \geq 0$
it is not a basic solution. How many basic solutions of this system may have? Find all the basic feasible solutions of the given system.

3. Solve the following L.P.P by simplex method [3]
Maximum $Z = x_1 + 2x_2 + 3x_3$
Subject to $x_1 + 2x_2 + 3x_3 \leq 10$
$x_1 + x_2 \leq 5$
$x_1 \leq 1$
$x_1, x_2, x_3 \geq 0$

Is the problem alternate optimal? If yes, give the alternate solution.

4. Write dual of the following L. P.P problem and solve the dual Problem [3]
Minimize $Z = 2x_1 + 2x_2 + 4x_3$
Subject to $2x_1 + 3x_2 + 5x_3 \geq 2$
$3x_1 + x_2 + 7x_3 \leq 3$
$x_1 + 4x_2 + 6x_3 \leq 5$
$x_1, x_2, x_3 \geq 0$

SEC-04 **[ONLY FOR STUDENTS OPTING FOR MATHEMATICS AS SEC]** [05]

Answer any One (1) question

1. A continuous random variable X follows uniform probability density function $f(x) = C;\ 2 \leq x \leq 5$. Find $P(X) < 3, P(X) > 4, P(1 \leq X \leq 3)$. [5]

2. A random variable has the following probability distribution: [5]

x:	4	6	7	8
$P(x)$:	0.2	0.3	0.2	0.3

Find the expectation and variance of the random variable.