Kandi Raj College – Department of Mathematics – Internal Examination – 6th Semester – Program course

Full marks: GCC-T-06 = 10 ; AND SEC-T-4A = 05 [ONLY FOR STUDENTS OPTING FOR MATH AS SEC]

GCC – T – 06 **10**

Answer all questions:

1. Solve the following L.P.P by graphical method: Maximize $Z = 3x_1 + x_2$ 03
Subject to the constraints:
$$2x_1 + x_2 \leq 2$$
$$6x_1 + 2x_2 \leq 9$$
$$x_1, x_2 \geq 0.$$

2. Define convex set and show that intersection of two convex sets is also a convex set. 02

3. Write the dual of the following L.P.P: Maximize $Z = x_1 + 2x_2 + 4x_3$ 02
Subject to,
$$x_1 + 2x_2 + 3x_3 \leq 10$$
$$x_1 + x_2 \geq 4$$
$$x_1 \leq 1$$
$$x_1, x_2, x_3 \geq 0$$

4. Find the optimal strategies and value of the game whose pay-off matrix is 03
$$\begin{bmatrix} 6 & -4 \\ -1 & 3 \end{bmatrix}.$$

SEC – T – 04A [ONLY FOR STUDENTS OPTING FOR MATHEMATICS AS SEC] **05**

1. **Answer any 1(One) question:**

(a) Show that $f(x)$ define by $f(x) = \begin{cases} 1 - |1 - x| & 0 < x < 2 \\ 0 & elsewhere \end{cases}$ is p.d.f of a continuous random variable and find the expectation also. 05

(b) The random variable X and Y have the joint density function 05

$$f(x, y) = \begin{cases} 6(1 - x - y) & for\ x > 0, y > 0, x + y < 1 \\ 0 & elsewhere \end{cases}$$

Find the marginal distributions of X and Y. Are X and Y independent?