

# SY PSOT IT E-24-25-A-B

**Started on** Saturday, 19 April 2025, 8:01 PM

**State** Finished

**Completed on** Saturday, 19 April 2025, 9:00 PM

**Time taken** 58 mins 25 secs

**Grade** 21.00 out of 25.00 (84%)

**Question 1**

Complete

Mark 8.00 out of 8.00

In optimizing the function

$$z = x_1 + 2x_2 + x_2x_3 - x_1^2 - x_2^2 - x_3^2$$

Find the following

Stationary point

- ☒ 1/2, 2/3, 4/3
- ☐ 2/3 ,3/5, 2/5
- ☐ 2/5, 2/3, 4/3
- ☐ 1, 2/3, 3/5

Value of D1

-2

Value of D2

4

Value of D3

-6

Z is

- ☒ max
- ☐ min

Optimized Value of z (2 places of decimal)

1.58

**Question 2**

Complete

Mark 6.00 out of 8.00

In optimizing the function

Optimize  $z = 10x_1 + 4x_2 - x_1^2 + 4x_1x_2 - 5x_2^2$  subject to  $x_1 + x_2 = 6$ ,  
 $x_1, x_2 \geq 0$

Find the following (Write all values in 2 decimal places without rounding up)

Stationary point  $X_0 = (X_1, X_2)$ Value of  $x_1$ Value of  $X_2$ Value of  $\lambda$ Value of  $\Delta$  $X_0$  is☐ min☒ maxOptimized Value of  $z$

**Question 3**

Complete

Mark 7.00 out of 9.00

In optimizing the function

$$\text{Maximise } z = 8x_1 + 10x_2 - x_1^2 - x_2^2 \text{ subject to } 3x_1 + 2x_2 \leq 6, x_1, x_2 \geq 0$$

Find the following (Write all values in 2 decimal places without rounding up)

Stationary point  $X_0 = (X_1, X_2)$ Case-I-- if  $\lambda = 0$ Value of  $x_1$ 

4

Value of  $X_2$ 

5

Case-II-- if  $\lambda \neq 0$ Value of  $x_1$ 

0.31

Value of  $X_2$ 

2.54

Value of  $\lambda$ 

2.46

In which case, Values of  $x_1, x_2$  satisfy all necessary conditions☐ case I☒ case IIOptimized Value of  $z$ 

21.30