

# Quiz 1: Constrained Optimization

m22cs060@iitj.ac.in [Switch account](#)



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Shortest distance point from (2,-1) to the straight line  $x+y=6$  is

2 points

- ☐ (6,0)
- ☐ (0,6)
- ☐ (9/2,3/2)
- ☐ None of the above



If  $x^*$  is a local minima of a constrained (inequality & equality) nonlinear programming problem then  $x^*$  must be a Fritz John point.

1 point

- ☐ True
- ☐ False

Lagrange/Fritz-John multiplier corresponding to an inactive inequality may be  $>0$

1 point

- ☐ True
- ☐ False

2 points

The following system of inequality has non-zero solution:

$$-2d_1 + 3d_2 < 0$$

$$3d_1 - 2d_2 < 0$$

- ☐ True
- ☐ False



2 points

Consider the problem

$$\min (x_1 - 1)^2 + x_2^2$$

$$2kx_1 - x_2^2 + 5 \leq 0$$

For which value of  $k$ ,  $(-1, 1)^T$  will be a Fritz-John point of the problem?

- ☐ 1
- ☐ -1
- ☒ 2
- ☐ None of the above



2 points

Consider the problem

$$\min x_1 \log(x_1) + x_2 \log(x_2)$$

$$s. t. x_1 + x_2 = 1$$

Solution of this problem is

- ☒ (1/2, 1/2)
- ☐ (2/3, 1/3)
- ☐ (1/3, 2/3)
- ☐ Solution does not exist

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