SOLVE WITH INSTRUCTOR

WEEK-8

By:-

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Rules:

- **Question will be shared on the screen.**
- **3-5 min will be given to solve the question.**
- **Learners can share there answer in chat box.**
- **Solution and steps will be discussed.**

1. (1 point) What will be constrained equation for the case when you have maximum 3 hours time to solve whole question paper. If it takes 10 minutes to solve a MLF (x) problem , 12 minutes to solve a Mathematics problem (y) and 5 minutes to answer one English question (z).

   A. $10x \leq 3$

   B. $10x + 12y + 5z \leq 3$

   C. $10x + 12y + 5z \leq 180$

   D. $12x + 10y \leq 3$

2. (1 point) Points $(0,0), (0,2), (2,2), (2,0)$ forms a convex hull. Which of the following points are the part of this convex hull?

   A. (-1,-0.5)

   B. (1,-1)

   C. (-3,1)

   D. (1,1)

3. (1 point) Given S is a convex set and the points $x_1, x_2, x_3, x_4 \in S$. Which of the following points must be the part of the convex hull formed by these points:

A. $0.4x_1 + 0.9x_2 + 0.3x_3 + 0.4x_4$

B. $-0.1x_1 + -0.2x_2 + 0.6x_3 + 0.7x_4$

C. $0.1x_1 + 0.1^2x_2 + 0.1^3x_3 + 0.1^3x_4$

D. $0.25x_1 + 0.12x_2 + 0.38x_3 + 0.25x_4$

4. (1 point) A storage shed is to be built in the shape of a box$(x * x)$ with a square base. It is to have a volume of 800 cubic meter. The concrete for the base costs 50 per square meter, the material for the roof costs 70 per square meter, and the material for the sides costs 60 per square meter. what will be the constrained equation.

A. $hx^2 < 50$

B. $hx^2 = 200$

C. $120x^2 + 240(x * h) < 200$

D. $120x^2 + 60(x * h) = 200$

5. (1 point) In the previous problem what will be our objective function.

A. $50x^2 + 70y^2 + 60(x * h)$

B. $50x^2 + 70y^2 + 240(x * h)$

C. $120x^2 + 240(x * h)$

D. $120x^2 + 60(x * h)$

6. (1 point) Which of the following is a convex function in $\mathbb{R}^2$?

A. $f(x) = 2x^2 + 5y^2$

B. $f(x) = -3x^2 - y^2$

C. $f(x) = 2x^2 - y^2$

D. None of these

7. (1 point) The minimum value of the function $f(x, y, z) = x^2 + y^2 + z^2$ subject to the constraint $x + y + z = 1$ is _____.

8. (1 point) What is the boundary value of y so that the function $(x-3)^2+(y+1)^2$ to remain convex?

   A. $y \geq 1$

   B. $y \geq 2$

   C. for any value of y function will remain convex.

   D. None of these

9. (1 point) Which of the following hessian matrix corresponds to the convex function?

A. $\begin{bmatrix} -5 & 2 \\ 2 & -3 \end{bmatrix}$

B. $\begin{bmatrix} 5 & 1 \\ 1 & 3 \end{bmatrix}$

C. $\begin{bmatrix} -7 & 2 \\ 2 & 3 \end{bmatrix}$

D. $\begin{bmatrix} 5 & 2 \\ 2 & 3 \end{bmatrix}$