CS5580 Quiz-9

StartWriting at S=5pm, StopWriting at D=5:40pm, Submit by D+15=5:55pm

NOTE: Please write your ROLL NO. clearly on ALL answer sheets.

1. Let $f : \mathcal{X} \times \mathcal{Y} \mapsto \mathbb{R}$ be a convex function and let $g(x) \equiv \min_{y \in \mathcal{Y}} f(x, y)$.
   (a) Is g convex ?
   (b) Express Legendre transform of g in terms of that of f.
2. Replacement for Quiz8: Let g, h be convex functions defined on R^n. Suppose h is bounded below and all its non-empty level-sets are bounded. Consider f defined by:

$$f(x) \equiv \min_{y \in \mathbb{R}^n} g(y) \quad \text{s.t.} \quad h(y) \leq x.$$

   Given that domain of f is convex, is f a convex function? Justify your answer.