2. Suppose the labor market is characterized by asymmetric information such that firms imperfectly observe the effort of workers. Initially, suppose the instantaneous utility of an employed worker is given by w-e where w is the wage paid to workers and e is the effort exerted by workers. Let e take on two values 0 or *e*. Let the probability that a worker will be caught shirking be given by q<1, the amount of unemployment benefits available to a worker to be given by y, let the probability that any given match ends exogenously be given by δ, and let workers discount the future using an interest rate given by r. Let the production function be given by F(eL) where L is the total amount of labor demanded and e is the effort level (initially assume all workers are the same). Also, assume there are no reputation effects so that workers who have been fired due to shirking cannot be distinguished from other unemployed workers. Answer the following questions:

(i) Characterize the value of being a shirking worker and a non-shirking worker and the incentive compatibility constraint associated with inducing workers not to shirk.
(ii) Characterize the labor market equilibrium in this model. Are wages rigid? Is there involuntary, inefficient unemployment? Does this model exhibit persistence in response to a shock? Discuss all of these questions.
(iii) Suppose the specification changes to one where workers are heterogenous with respect to their abilities to avoid being caught shirking. In particular, suppose that in each period a worker gets a draw q_i from a distribution h(.) that indicates the probability that the worker would get caught shirking where the range of q_i is given by [0,Q] where Q<1 . Characterize the decision to shirk in this new specification. Characterize the new labor market equilibrium. How does the labor market equilibrium differ from that associated with the original specification? Discuss.
(iv) Suppose the specification changes (from the original) to one where workers can post a bond, B, that they will forfeit if they are caught shirking. Using the original assumption that workers are homogenous with respect to their abilities to avoid detection, characterize the decision not to shirk and the labor market equilibrium? What would be the optimal bond? Discuss. How does the labor market equilibrium differ from that associated with the original specification? Discuss. In terms of real world applicability, do we ever see anything like a worker posting a bond? Discuss.