Student's affirmation: I certify that I have neither taken help in completing this exam nor helped anyone else with this exam. I have never discussed this exam with anyone other than the instructor and TA. I have not used ChatGPT, Llama, or other AI tools to create or influence my solutions.

(Signature) _____

Mandatory: Affirmation and signature on the first page; name on every page; submission as PDF.
If you make assumptions about any problem, state them, but be prepared to justify why they were necessary.

Problem	1	2	3	Total
Points:	22	40	38	100
Score:				

This exam has 3 problems, for a total of 100 points.

Throughout, I prefer that you think afresh but if you come across a source on which you base your answer, please be sure to cite it. (Some problems ask for a specific author or source.)

1. (22 points) Mark the following statements true or false. Provide a short explanation of about 10–20 words. You can and should provide a source where appropriate. Where the statement is about a paper, please specify the corroborating part of the paper (e.g., "Page 32, second para, lines 4–6").
    A. For the purposes of this course, a hypothesis is an assumption a project team makes that justifies their approach
    B. As described by Jeffrey Travers and Stanley Milgram, their own study involved first developing a social graph and then analyzing it for connectivity
    C. If you have a weak tie to someone, chances are high they have high betweenness centrality in the social network
    D. Ian McCulloh describes a study wherein subjects could be influenced to provide a description of something that they themselves didn't believe
    E. Watts and Strogatz argue that real-life small worlds such as in social networks are generated by starting from a ring and then randomly swapping some edges
    F. Galton accepts Hooker's point that the mean is a better statistic than the median to estimate what he might call the "voice of the people"
    G. Kleinfeld makes the case that, despite the fame of the six degrees of separation studies by Travers and Milgram, these studies have not been reliably replicated
    H. Yolum argues based on a simulated referral network that if each node adopts a policy of always providing a referral and each node updates its out-edges to point to the most useful other nodes, then the distribution of Page Ranks of the nodes follows a power law
    I. Camerer et al.'s cognitive-hierarchy model and empirical results suggest that a typical human thinks strategically about the decision making of other players to the extent of 1.5 levels deep on average
    J. Camerer et al. express an intuition that coheres with Wolfers and Zizewitz's remark that there would be no trade in a prediction market between rational players who had common prior knowledge
    K. Our beauty contest exercise indicates that only people who are much better than their peers at thinking deep can win such contests
2. A hurricane is approaching a part of the state that doesn't generally see hurricanes. You are developing an app that will help mobilize members of the public (living in one of the towns that might be flooded) into helping place sandbags at appropriate places to protect their town.

(a) (8 points) Describe how your app may mobilize the public into participating. Use about 20 words.

(b) (8 points) Describe how you might adapt insights from Granovetter's work to apply to mobilization. Use about 30 words.

(c) (8 points) Describe how you might adapt insights from Gigerenzer's work to apply to mobilization. Use about 30 words.

(d) (16 points) Describe three social computing ideas *discussed* in class (besides any mentioned in your solutions to the above parts) as well as one social computing *not discussed* in class that your app will embody. Make sure the ideas are distinct and cover some of the major themes introduced in class. (For example, no more than one of your ideas should be based on the balloon challenge we discussed.) Highlight the ideas by placing them in a numbered list. Provide a source for each idea—for three of them, which reading from the class, and for the fourth, whether it is original to you or you have an external source.

Use about 60 words.

3. Consider the following distinct scenarios based on the following common assumptions.

There is an open marketplace for used Halloween decorations that attracts both buyers and sellers. The marketplace operates as follows.

- The marketplace has a conveyor belt on which items for sale are placed.
- Each item's seller has placed a price tag on its underside, which is not visible to a buyer.
- Each buyer stands at a spot at the conveyor belt with partitions between the spots.
- The items become visible to a buyer one by one.
- A buyer may bid a price to buy an item passing by that they are interested in.
- If so, the item is flipped over.
- If the bid placed exceeds the marked price, the buyer must purchase the item at the marked price.
- Otherwise, if the buyer doesn't bid on an item or bids too low, the buyer gets no chance to purchase that item again.

(a) (6 points) No buyer or seller is aware of another buyer or seller. Explain whether this marketplace is incentive compatible for buyers.

(b) (6 points) No buyer or seller is aware of another buyer or seller. Explain whether this marketplace is incentive compatible for sellers.

(c) (10 points) Three friends go shopping together and manage to stand in adjacent spots placing bids on items passing on the same conveyor belt. Assume the friends cannot communicate once inside the marketplace but may have shared their goals before entering it.

Explain whether this marketplace is incentive compatible for such groups of buyers.

(d) (16 points) In this variant, assume the conveyor belt is laid out as a ring (or a bag carousel, as at airports).

- A buyer may bid at an item only the first time they see it.
- If an item reaches a bidder the second time and they had the highest bid throughout its trip, they get it at the third-highest price (assume there are enough bids for the third-highest price to be defined).

Explain whether this marketplace is

i. Incentive compatible for buyers.
ii. Incentive compatible for sellers.
iii. Rational for buyers.
iv. Rational for sellers.