Midterm Examination

The maximum points awarded for each correct answer is indicated for each question. I've tried to assign points so that these correspond roughly to the number of minutes I'd expect it to take you to answer the question; your mileage may vary. Good luck!

1. (7 points)
   Tweedle-dee and Tweedle-dum are similar in every way except that Tweedle-dee has preferences over tea ($T$) and biscuits ($B$) given by
   \[ U_1(T, B) = \ln(T) + \ln(B) \]
   while Tweedle-dum has preferences given by
   \[ U_2(T, B) = 2TB \]
   Explain whether the following statement is True, False, or Uncertain.
   “We can tell them apart from their behavior because Tweedle-dum will drink more tea.”

2. (28 points)
   For each of the following, indicate if the statement is True, False, or Uncertain. Briefly justify your answer.

   a) The price elasticity of the Marshallian demand function will always be greater than the price elasticity of the Hicksian demand function, because while the change in the Hicksian demand measures only the substitution effect from a price change, the change in Marshallian demand is equal to the substitution effect plus an income effect.

   b) Consider an economy with only two goods, beans and rice. If the price of both double then compensated demand for each good must fall.

   c) Consider an economy with only two goods, wine and beer. For a person with income $Y$ who isn’t fond of alcohol (but who nonetheless prefers more to less), both goods may be inferior.

   d) If income elasticities are equal for all goods, then no good can be inferior.
3. (15 points)

For consumer behaviour, we normally assume the following properties:

a) Transitivity
b) Non-satiation (more is better)
c) Differentiability
d) Completeness
e) Quasi-concavity

For each of the indifference maps shown below, indicate which assumptions about behaviour are violated. (Some maps may violate more than one assumption.) Briefly justify your answer.
4. (40 points) Consider the plight of two different people, Ann and Bill. Ann and Bill are both equally skilled network administrators. Ann lives in Ohio, where she pays a monthly rent of $1000 for a 1000 square foot apartment; Bill lives in Oakland, where his monthly rent is $2000 for an otherwise identical apartment. Prices of goods other than housing are the same in the two regions.

a) Suppose that both Ann and Bill have ordinal utility functions
\[ U(h, z) = \alpha \log(h) + (1 - \alpha) \log(z), \]
where \( h \) is housing services (measured in square feet occupied per month), and \( z \) is a composite of other commodities, the prices of which satisfy the conditions of the composite commodity theorem. Derive Ann and Bill’s Marshallian demands for housing and other goods. Give an interpretation of the parameter \( \alpha \); how does it affect choices between housing services and other goods?

b) Suppose preferences are as in (a), but with \( \alpha = 0.25 \). What are the locally prevailing monthly salaries for network administrators in Ohio and Oakland?

c) Now suppose that Ann and Bill’s monthly incomes are equal to the numbers you’ve derived in (b), but that we don’t know what the value of \( \alpha \) is. Furthermore, Ann’s \( \alpha \) may be different from Bill’s \( \alpha \). Either Ann or Bill could choose to move to the other’s location and get a job as a network administrator at the prevailing local salary, yet they choose not to. What can you say about the value of Ann’s \( \alpha \) relative to Bill’s \( \alpha \)?

d) A pollster surveys a random sample of Ohio residents and California residents, and asks each respondent “Would you say that you’re a) Very happy; b) Pretty happy; or c) Not so happy?” After tabulating the results, the pollster finds that on average people in Ohio are just as happy as in California. Is there anything surprising about this finding? Explain.