ECONOMICS 151 FINAL EXAM – SPRING 2016

1. [14 pts] **True or False**. Circle your response. No explanation is needed.

a. [2 pts] When the free market delivers efficient outcomes, the government should not intervene in the economy.

True False

b. [2 pts] In a two-person exchange economy, an efficient outcome could occur at a point inside the utility possibilities frontier.

True False

c. [2 pts] Randomly allocating rent-controlled apartments on a first-come first-served basis to those who choose to wait in line could lead to more deadweight loss than randomly allocating the apartments to the individuals lucky enough to win a lottery.

True False

d. [2 pts] In the U.S., federal government spending exceeds combined state and local government spending.

True False

e. [2 pts] If an individual who receives positive benefits from a project is pivotal, it is possible that the individual could end up paying more than the project is worth to him/her under the Clarke tax scheme.

True False

f. [2 pts] If we are trying to put a dollar value on input costs to a government project for a cost benefit study, the market price is likely to overstate the appropriate value for an input that is produced by a monopolist.

True False

g. [2 pts] If the median voter theorem applies, then the outcome of majority voting over the level of provision of a public good will be equal to the efficient level.

True False

2. [9 pts] Imagine you would like to estimate the causal impact of attending a No-Excuses charter high school on later college outcomes. No-Excuses charter schools tend to serve economically disadvantaged students and emphasize strict behavioral and academic expectations.

a. [3 pts] Explain why comparing the outcomes for students who attend No-Excuses charters vs. those who do not is likely to yield biased estimates.

b. [3 pts] Suppose more students want to attend a charter school than the charter school can accept. What method could you use to estimate causal impacts if the charter uses a lottery to determine which students are admitted? Briefly explain the logic behind this method.

c. [3 pts] Now suppose that the charter school sorts applicants according to their scores on an admissions exam, and admits all students with a score above a certain threshold and rejects the others. What method could you use to estimate causal impacts in this case? Briefly explain the logic behind this method.

3. [20 pts] Two firms are ordered by the federal government to reduce their pollution levels. Firm A's marginal costs of pollution reduction R are $MC^A = 2R^A$. Firm B's marginal costs of pollution reduction are $MC^B = 5R^B$. The marginal benefits of pollution reduction accrue to citizens and are equal to 20.

a. [4 pts] Find the equation for the social marginal costs (SMC) of pollution reduction.

b. [7 pts] What is the social optimally level R* of pollution reduction? Represent this point in a carefully labeled graph that has pollution reduction on the x-axis. Make sure to draw and label all three marginal cost curves (MC^A, MC^B and SMC) and the social marginal benefit curve (SMB). Also show that area that represents social surplus (SS) at R*.

c. [6 pts] Imagine the government mandates that each firm reduce pollution by ½ R*. Explain why this would not be efficient. What allocation would be efficient?

d. [3 pts] If the government initially allocates ½ R* of required pollution reduction to each firm but then allows them to trade, which firm would pay the other to take on some of its allocated reduction? Briefly explain why.

4. [10 pts] Suppose you live in an apartment in downtown San Francisco. An aspiring DJ lives in the apartment directly above yours. The DJ receives no private benefit from noise reduction and faces a private marginal cost of noise reduction equal to $15 + 2q$, where q is the amount of noise reduction. You have a perfectly inelastic demand for noise reduction equal to 10 units per month. That is, you require a certain amount of peace and quiet in order to live and work happily.

a. [2 pts] If the DJ is given the right to play loud music and there is no scope for bargaining between you and the DJ, what will the resulting level of noise reduction be? Briefly explain.

b. [4 pts] What is the socially optimal level of noise reduction? Illustrate your answer on a carefully labeled graph with the amount of noise reduction on the *x*-axis.

c. [4 pts] Suppose now that you may bargain with the DJ over the amount of noise reduction. Find the minimum amount by which the DJ must be compensated in order to achieve the socially optimal level of noise reduction. Briefly explain the intuition behind how you found this amount.

5. [26 pts] There are 3 types of people in San Francisco: consultants, people like your neighbor who are DJs, and people like you who work for technology start-ups. You all obtain utility from consumption of the private good, *c*, as well as from the stock of knowledge created through publicly funded research, *G*. The preferences for each type are given by:

$$U^{\text{consultant}} = c + 10\ln(G)$$

$$U^{\text{DJ}} = c + 20\ln(G)$$

$$U^{\text{tech}} = c + 40\ln(G)$$

Consultants have an income of 300, DJs have an income of 100 and tech workers have an income of 200. There are *N* individuals of each type, and both *c* and *G* have a price of 1.

a. [4 pts] Briefly explain how knowledge has the two characteristics of a pure public good.

b. [4 pts] Describe the condition that must hold under efficient provision of a pure public good and briefly explain why it differs from the condition for efficient provision of a private good.

c. [4 pts] Find the efficient level of publicly funded research.

d. [4 pts] Briefly explain the two conditions that must hold in a Lindahl benefit tax equilibrium.

e. [4 pts] Find the tax shares paid by each type of person in the Lindahl equilibrium.

f. [6 pts] Use the tax shares from part (e) and the efficient level of G you solved for in part (c) to compute the total amount each type contributes towards the public good. Briefly describe how these amounts relate to the levels of income for the respective types of people, and why. How is your result influenced by the form of the utility functions used in this question?

6. [20 pts] A major part of post-secondary education in the United States is the community college sector. These institutions provide vocational training as well as lower-division academic coursework for those intending to transfer to 4-year institutions. Assume that the city of San Diego must choose between community college degrees (*C*) and all other goods (*Z*). Its preferences are given by $U(C,Z) = \ln C + 2\ln Z$. The prices of *C* and *Z* are both equal to \$1, and the city has an income of \$9,000.

a. [4 pts] Provide two justifications for government involvement in higher education. Briefly explain each.

b. [2 pts] Provide and briefly explain one justification for government NON-involvement in higher education.

c. [4 pts] Given its preferences and income, how many degrees will the city choose to provide?

d. [4 pts] If the state offers a dollar-for-dollar matching grant to the city, so gives the city $1 for every $1 the city spends on community college degrees, how many degrees will the city choose to provide? How large is the grant received from the state?

e. [6 pts] Imagine the state were instead to give the city a block grant equal to the matching grant amount received by the city in part (d). Using a carefully labeled diagram of the city's budget constraint under the matching and block grants, explain whether the level of college degrees would be higher or lower than in part (d), and why. No calculations are needed.

7. [11 pts] At the California state legislature in Sacramento, lawmakers are debating policy proposals to increase per-student expenditures for community colleges. The three proposals are as follows: 1) No change in funding, 2) a $1,000 increase in funding per student, and 3) a $2,000 increase in funding per student. In addition, there are three voting blocs:

Group A: Prefers more community college funding to less
Group B: Prefers best the $1,000 increase in funding, but then would prefer no new funding to the $2,000 funding request
Group C: Prefers best no new funds, but would go with the largest funding proposal if any new spending occurs

a. [5 pts] Which groups' preferences are single-peaked? Explain or demonstrate why. You may use a graph.

b. [6 pts] Assuming equal proportions of voters in each group, will majority voting generate consistent outcomes? Explain and demonstrate why or why not.

8. [10 pts] Fiscal federalism and local public goods

a. [6 pts] Describe three assumptions of the Tiebout model and briefly explain why each assumption is needed.

b. [4 pts] Describe two key justifications for providing local public goods at a more centralized level of government.