**Instructions for the take home exam.** The take home exam is “**open book**,” but **not open internet or AI** apps. That is, you are free to use your class notes and the webnotes for the exam, but not use other internet resources. By turning this exam in, you have agreed to abide by the WVU honor code and attest that the exam is your own work, and not based on conversations with or copying from others.

**Your finished exam is due at 6:00 PM on Friday May 3.** Your exam should be titled “EC201\_EX2\_yourlastname\_yourfirstname” and sent to me as a **Word File via email at** [**roger.congleton@mail.wvu.edu**](mailto:roger.congleton@mail.wvu.edu)**. Add the word “figures” to this name if you send those in a separate file.**

I will most likely download the exams on Friday evening and begin grading on Saturday morning. But it is possible that most of the grading will be done on Sunday. So, be sure to check your email Saturday afternoon, Sunday afternoon, and Monday late morning just in case something goes wrong with the submission process. If you do not see anything from me, then I have received the exam in readable form and graded it.

1. Matching: Identify and/or Define (20 points).

**Fill in the blanks** on the left with the most accurate of the definitions or characterizations on the right.

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| 1. \_\_\_\_\_ | marginal benefit | 1. The value of the alternative use of a resource (such as time or money) that an individual gives up when choosing one action over another |
| 2. \_\_\_\_\_ | opportunity cost | 1. The increase in total cost caused by producing an additional unit of output |
| 3. \_\_\_\_\_ | expected value | 1. The maximum amount that an individual is willing to pay to have one more unit of a good or service |
| 4. \_\_\_\_\_ | present value | 1. The average value of a large sample drawn from a random process |
| 5. \_\_\_\_\_ | Knightian uncertainty | 1. Total “X” divided by quantity, where “X” might be cost, benefit, or profits. |
| 6. \_\_\_\_\_ | creative destruction | 1. Current amount that can be used to generate a future benefit or cost or series of benefits or costs when the interest rate is “r.” |
| 7. \_\_\_\_\_ | monopolistic competition | 1. Any value that is produced by a stochastic process with known properties |
| 8. \_\_\_\_\_ | median voter | 1. A tax that is set equal to the spillover cost associated with production or consumption |
| 9. \_\_\_\_\_ | positive externality | 1. A choice setting where the probability of the various consequences of one’s actions is not known or unknowable. |
| 10. \_\_\_\_\_ | social net benefits | 1. Innovations that disrupt a long run equilibrium by creating many new possibilities for firms and/or consumers |
|  |  | 1. A market with many firms producing essentially identical goods with lots of (potential) consumers |
|  |  | 1. A market with many firms producing somewhat different but similar goods and lots of (potential) consumers |
|  |  | 1. The voter that is indifferent between the alternatives on the ballot |
|  |  | 1. The voter whose ideal point is in the middle of the distribution of voter ideal points |
|  |  | 1. An activity that produces spillover benefits for others |
|  |  | 1. An activity that imposes spillover costs for others |
|  |  | 1. The sum of all the benefits associated with an activity minus the sum of all the costs associated with that activity |
|  |  | 1. A term that means the same thing as Pareto efficiency |

1. The Geometry of Markets and Market Equilibria
2. (10 points) In the space below draw three diagrams to characterize a competitive market in long run equilibrium. This will include a market diagram, a firm diagram, and a consumer diagram. Label all important details including profit and consumer surplus.
3. (15 points) (a) In the space below, draw a diagram of a monopolist’s optimal output and pricing decision. Label all important details. (b) Then, in a second diagram, illustrate the effects of an innovation in production technology that reduces the marginal cost of producing the good of interest. (Hint, the second diagram should include two outputs and two prices.) Label all important details.
4. (10 points) (a) In the space below illustrate a consumer’s decision to purchase a product with uncertain quality. Assume that he or she is risk neutral and that the probability of a “good” unit is the same as the probability of a “bad” unit. Label all important details and **briefly discuss** how the probability of a “good” unit affects his or her choice.
5. Applications
6. (15 points) According to the median voter model of policy choices, the median voter’s preferences (expected present value of net benefits) determine the long-term policies that are adopted.
7. Draw a diagram that characterizes a voter’s demand for highways, where his or her marginal cost reflects his or her marginal tax payments (and/or tolls) used to pay for additional highways.
8. Briefly discuss why a voter’s expected rate of highway use affects his or her expected marginal benefits from highway construction. Also briefly discuss how the voter’s discount rate (or the interest rate) affects his or her choice. How are these effects captured by your diagram?
9. (15 pts) Draw a diagram that illustrates the choice setting of a price-making firm with probabilistic demand curve. Suppose that the probability of a high demand is 0.5 and that of a low demand is also 0.5. Assume that the firm is risk neutral and attempts to maximizes its expected profits.
10. Characterize its output level and average price.
11. What price does it sell its output when the low demand case arises?
12. It can be argued that this is exactly the setting faced by producers of electric vehicles such as Tesla. Briefly discuss the relevance of this model for Tesla’s pricing decisions over the past two years.
13. (15 pts) Adam Smith once wrote: “It is not from the benevolence of the butcher the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity, but to their self-love, and never talk to them of our own necessities, but of their advantages. Nobody but a beggar chooses to depend chiefly upon the benevolence of his fellow-citizens. Even a beggar does not depend upon it entirely.”
14. In a few sentences, explain why the models of supply and demand developed in this course consistent with Smith’s description of self interest in markets?
15. Are there any exceptions to that perspective in your experience? (Hint: how might internalized norms affect your interpretation of the quote from Smith? Need “interests” be narrowly self-oriented?)
16. In what ways are Adam Smith’s comments consistent with your own dealings in markets?