

I. (30%) Short Descriptions: Answer 10 of 12 (3% each)– Key answers may be more complete than necessary.

1. *Arrow's Impossibility Theorem: A proof that no method of determining social choice from individual preferences could reliably be consistent (independent of irrelevant alternatives, transitive), fair (non-dictatorial, preferences not imposed), and decisive (meeting the Pareto principle). It works by showing circumstances in which any decisive coalition could be broken into inconsistent groups. It implies that we cannot really know with certainty what society wants.*
2. *Capitalism: An economic system characterized by the private ownership of property, where firms hire labor, compete, and produce for a market intending to make a profit. It emerged in the last several centuries, and has led to industrialization, urbanization, export orientation, and unprecedented rates of self-sustaining growth, along with a population explosion and rapid exploitation of natural resources.*
3. *Communism: An ideal economic system in which scarcity is eliminated, everybody acts in the social interest rather than their own self interest, markets, money, and private ownership cease to exist, and the state withers away. Louis Brand coined the definition, "From each according to his ability, to each according to his need." As a political system, it refers to the effort to eliminate capitalism and its vestiges, usually by a repressive Marxist-Leninist government.*
4. *Feudalism: An economic, social, and political system in Europe's middle ages (circa 9th - 14th Centuries) based primarily on the relationship of lord to vassal. Land was held in feud, meaning that the tenant owed services to the lord in return, from serf to lord to overlord, ultimately to the king. Property rights were limited, though there was mutual responsibility between lord and vassal based on tradition. The economy was predominantly rural, agricultural, cellular, and autarkic at the manorial level. The social structure was extremely rigid, mobility was very limited, and the Church played a strong role, for better or for worse.*
5. *Gershchenkron Effect: If we use the purchasing-power parity method to convert another country's output into our own currency by multiplying our own prices times their quantities, we will avoid the problem of using official exchange rates that do not usually reflect purchasing power parity, but we will tend to over-estimate their output. Because relative prices differ between countries, and because goods which are relatively scarce tend to have relatively higher prices (and vice-versa), we would be giving our relatively higher weights to what they produce relatively more of, and relatively lower weights to what they produce relatively less of. The implication is that we simply can't make accurate comparisons of living standards between countries using different currencies.*
6. *Invisible Hand: Adam Smith argued that men acting in their self-interest promote the social interest as if guided by an invisible hand, and do so more effectively than if they had intended to act for the benefit of society.*

7. *Laissez Faire: Part of a French phrase meaning "let do, let go, let pass," it refers to a minimalist government in which the economy is left almost entirely to unregulated private markets. Under the Invisible Hand, the best government is one which follows a laissez faire policy.*
8. *Madisonian Liberalism: The philosophy that majority rule or other methods of voting may not determine the best policy, but will still act as a check on power, by punishing corruption and the abuse of power and otherwise preventing the worst policies. Churchill's saying was that democracy is the worst system, except for all the others. While political entrepreneurship can lead to socially less-preferred policies in order to form new governing coalitions, returning to the center can often be a winning strategy.*
9. *Mercantilism: A philosophy that promoted capitalism as a tool of the state. Trade was viewed primarily as a way to increase the state's accumulation of gold and other specie, as a zero sum game in which exports led to wealth and power. As a result, states also encouraged monopolies for their power and their revenue potential.*
10. *Prisoner's Dilemma: The Prisoner's Dilemma is a model of how well-informed and self-interested individuals may face incentives to not cooperate, and as a result all players become worse off. In some cases this may be good for society, such as when competition makes firms worse off by driving their profits to zero, while in other cases society may be worse off as a result of self-interest. Since the Prisoner's Dilemma model is solved by making individual choices interdependent and iterative rather than independent, and by punishing those that defect from cooperation, the most efficient government may be one that coerces cooperative behavior at times and limits individual choices.*
11. *Public Good: A public good is something produced with scarce resources that society desires, but with two particular characteristics that make it highly unlikely that private producers would provide it in efficient quantities. These characteristics are nonrivalrous consumption, which implies that marginal cost (the efficient price) is zero, and nonexcludable benefits, which leads many users to act as free riders. This implies that governments can provide what private producers cannot, paying for it through mandatory taxation.*
12. *Socialism: An economic system in which the state, under the unchallenged control of a Marxist-Leninist communist party, attempts to eliminate capitalism through state ownership of the means of production, and possibly the elimination of most private markets. This is not to be confused with the political philosophy of increased government intervention in a capitalist economy.*

II. (50%) Short Answers. Answer *five* of the following six questions in a single paragraph each. Each is worth 10%. Don't answer more than is necessary.

- a. What are Bernstein's four conditions for growth? Explain each, and give examples.

According to Bernstein, the four conditions necessary for sustained economic progress include: (1) property rights, since creators must have proper incentives to create; (2) scientific rationalism, for innovators must be allowed to innovate without fear of retribution; (3) capital markets, since entrepreneurs must be given access to capital to pursue their visions; and (4) transportation and communication technologies that enable society to spread ideas and transport finished products to larger markets. These conditions were first met in the Netherlands, then the UK, then the USA, and in the 19th Century steamships, railroads and telegraph accelerated everything.

- b. If we think of the economy as a production process, what are the five inputs or factors that determine aggregate output? Which results in intensive growth, and which in extensive growth? Which one is sustainable, and why?

We can write the economic production function as $Q = T \times f(NR, PC, LF \times HC)$, where Q = real economic output produced, T = total factor productivity, NR = natural resources (including land), PC = produced capital assets, LF = labor force, and HC = human capital assets per capita. Improvements in technology and human capital result in intensive growth, and in theory this type of growth is sustainable. Using more natural resources, produced capital assets, or raw labor results in extensive growth, but there are limits to these available resources and they are also subject to diminishing marginal returns.

- c. Explain Olson's bandit model, how it contrasts with Locke's social compact, and under what conditions the bandit model predicts similar economic policies.

Olson's bandit model views the state as more predatory than voluntary. Applied to the state, this model presumes that government is imposed and in the self-interest of the government. In contrast, Locke's social contract presumes that the state is created by voluntary participation, and is in the self-interest of the governed. In order to provide for a common defense, protect the group against the misbehavior of individual members, and provide for other public goods, people voluntarily submit to a government. Bandits tend to take everything from their victims; once they become stationary, however, they no longer take everything, since this would make continued theft impossible (a 100% tax on nothing is still nothing). Instead, stationary bandits maximize the revenue they can receive over time, and may find it in their self-interest to enforce order and peace (since this reduces competition from other bandits) and promote economic development (since this gives more to steal). Thus, stationary bandits may act in the interest of the governed, if they believe that this benefits them.

- d. Why did Marx believe that capitalism was inherently exploitative but historically necessary? Why did he believe that capitalism would eventually self-destruct?

Marx's theory of surplus value relies on the labor theory of value, in which only labor actually creates value while capital only transfers value. Thus, when the capitalist makes a profit, he necessarily does so by taking from the worker the fruits of his production, and this is exploitation. Since the capitalist uses these profits to accumulate more capital, capitalism is an engine of progress and necessary to the eventual elimination of scarcity. The major internal contradiction of the capitalist system, according to Marx, is the process of accumulation by the capitalist class and its exploitation of the proletariat. Competition drives the capitalist to accumulate capital; if labor is the sole source of value, as the labor theory of value claims, then this capital accumulation must lead to a falling profit rate. Since profits are required to maintain accumulation and continue competing, the capitalist must increase the rate of exploitation and lower wages paid to workers, an action possible only because of the threat implied by the reserve army of the unemployed intentionally maintained by the capitalist class. The result is an unstable economy, with overproduction and underconsumption, and an impoverished working class. Increased rates of exploitation resulting from accumulation, competition, and falling profits will, in time, lead to eventual class consciousness and a revolution to establish the dictatorship of the proletariat.

- e. What four conditions are necessary for evolution to occur? Is the hypothesis of economic evolution consistent with the neoclassical view of gradual, stable, and predictable progress? Explain.

Evolution results from adaptation to the environment, and requires (1) variation in characteristics related to survival, (2) a selection mechanism (such as the bankruptcy of poorly adapted firms due to competition), (3) a means of transmitting selected traits to successive generations (such as heredity in biology), and (4) iteration (or time). Applying this to economics, evolution no longer means that the economy changes gradually and predictably. Evolution is highly contextualized; it can be gradual, but is more likely characterized by punctuated equilibrium, long periods of slow change broken by rapid catastrophically-induced adaptation. Change may be path-dependent as a result of increasing returns and co-evolution, so it becomes hard to predict or compare its direction.

- f. How has the size and the economic role of the U.S. government changed over the past century? What does the evidence demonstrate for how this changed role has affected the overall performance of the U.S. economy?

The U.S. federal government has grown substantially during the 20th Century, from roughly 4% of GDP before FDR to an average of almost 23% by the early 1980s, though this share declined to 20% by the late 1990s. The size of state and local governments, on the other hand, only grew from 7% to almost 11% during the same period. Expansion of the economic role of the federal government began much earlier, however, with land grants, railroad regulation during the populist era, trustbusting, consumer protection, and the creation of a central bank, during the progressive era, and an income tax during the first world war. After the Great Depression, the federal government gradually became much more involved, becoming responsible for social security, Medicare, macroeconomic management, environmental protection, and so forth. This role began to be somewhat scaled back, beginning during the Carter and Reagan presidencies, with the deregulation movement. Contrary to expectations, the available evidence does not seem to demonstrate that this growth in government was bad for economic performance: in per-capita terms, the economy has grown faster since government got bigger than before, and rates of growth and even price inflation have become much more stable as well. Of course, the government of the U.S. has grown less and remains smaller than in almost all other developed market economies.

III. (20%) Essay. Write an essay on **one** of the following two topics, answering all questions in the topic in a single coherent essay. You should be able to write a clear, concise, cogent, and coherent essay which addresses each issue raised without sacrificing the flow of your essay. Demonstrate an understanding of the lectures and readings, and reference readings where appropriate.

A. What are the three Arrow-Debreu welfare theorems? What do they mean, and what do they tell us about perfect markets? What are the three conditions for perfect markets, and what do they mean? If these conditions are not met, what does the Theorem of the Second Best tell us about the relative efficiency of a market economy? Explain.

The three Arrow-Debreu theorems are (1) existence, (2) efficiency, and (3) distribution. The existence theorem proves that at least one set of relative prices exists that would yield a Competitive General Equilibrium (CGE), in which all markets clear simultaneously at prices that equate relative marginal costs with relative marginal utilities (or values). To actually achieve CGE, of course, would require both perfect competition and perfect information. The efficiency theorem, also known as the First Fundamental Theorem of Welfare Economics, says that if there are complete markets, then any CGE is Pareto Optimal, even under the Kaldor Compensation Criterion. Thus, if three perfect market conditions are met, a free market economy would be perfectly efficient.

The distribution theorem, better known as the Second Fundamental Theorem of Welfare Economics, says that any possible CGE is consistent with some appropriate redistribution of resource ownership, meaning, for example, that free markets could be consistent with a more equal distribution of income if the ownership of productive factors could be distributed more equally. In a free market, income distribution results from what you own and how the market values it; if you change what you own, it is not necessary to mess with the market.

The three conditions for perfect markets are: (1) perfect competition, with many buyers and sellers so no individual may control the price alone; (2) perfect information, so we all know all relevant information about the goods we are buying and selling; and (3) complete markets, so there is a market for everything, with no externalities or public goods as a result. Violations of the first condition include monopolies; violations of the second include adverse selection, moral hazard, or fraud; violations of the third include pollution, national defense, and the market for babysitters.

Pareto Optimality is the economic condition in which no further mutually-beneficial trades are possible, and so no one can be made better off without someone being made worse off. It implies that the economy, at a static moment in time, is perfectly efficient in its use of scarce resources, particularly if we assume (as Kaldor suggested) that winners could, in principle, compensate the losers if any further change improved overall efficiency – even if such compensation never actually occurred.

If the perfect market conditions are not met, then a free market economy will probably not be perfectly efficient. Unfortunately, the Theorem of the Second Best then informs us that second-best solutions cannot be determined, and more market failures may not be more inefficient than fewer market failures since it is possible that failures offset each other to some degree. Thus, once we leave the world of perfect markets, we can no longer prove that markets are relatively efficient.

B. What are the basic theoretical and practical reasons for state intervention in the economy? What role could the state play to improve a country's economic performance? Why might even a well-intentioned government (i.e., one that is a Lockean social contract) still result in government (i.e., public) failure?

Theoretically, the state may be economically justified in intervening in the economy in order to correct market failures (e.g., monopolies, information failures, or externalities), enforce cooperation, provide public goods, and stabilize the macroeconomy. Theoretically, the state may also intervene to improve the equity of income distribution, provide so-called merit goods, or meet other non-market objectives.

The state may therefore define and enforce property rights through establishment of a legal system; tax its citizens to pay for public goods (e.g., national defense, police, or fire protection); correct externalities through subsidies, taxes, or regulation; control or break up monopolies and enforce competitive behavior; follow fiscal and monetary policies to stabilize prices, employment, and output; and improve market information by requiring full disclosure or truth-in-advertising.

However, there are many reasons the state may not be able to intervene efficiently, and what we call "public failure" implies that state intervention makes the economy less efficient. Even if the state is well-intentioned, it might occur if the state lacks information about how to correct market failures (particularly since market prices are not present, and in a market economy the state is left with the most intractable problems), or if the state is unable to provide its agents with clear appropriate incentives. Large bureaucracies are always difficult and expensive to manage, especially when their objectives are hard to define and their performance is hard to measure. Such agencies tend to be risk averse, they may fear success because it threatens the agency's survival (unlike in the private sector, where success usually ensures survival), and they may be "captured" by private industries they are supposed to regulate. If the state is involved in providing services, because labor productivity in services typically does not rise as fast as in other sectors, then the cost disease hypothesis argues that the state's share of output will inevitably increase. Furthermore, even well-intentioned political leaders must get power, retain power, and extend power to be effective, and this all requires efforts to please decisive coalitions. Add to this the impossibility of determining society's preferences, and public failure seems more likely.

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