Short answer
Answer each of the following in either a single word or a few sentences. Bullet points are an acceptable way to arrange your response.

1)
Compare and contrast. Fill in the blank with the following options:
- Market liberals
- Institutionalists
- Bioenvironmentalists
- Social Greens

_____ believe economic growth, through globalization, coupled with market-based incentives will improve the environment.

In contrast, _____ see economic globalization as the primary cause of exploitation, unequal consumption, and global environmental crises.

_____ agree that globalization is a driver for unsustainability however, they focus on human's instinct to exceed the earth's carrying capacity over issues of justice.

_____ see globalization as a tool to promote norms that encourage wealth distribution and healthy environmental patterns.

2)
In the essay *Do Artifacts Have Politics?,* Langdon Winner describes two ways in which technology shapes political arrangements. Describe each and give an example.

3)
Compare the carbon tax and cap & trade systems. What are they? How are they different?

4)
In regards to the Paris Agreement, explain the meaning of the term 'NDC.' How are NDCs decided amongst parties of the agreement? How are these expected to change over time?

Long answer
Answer two (2) of the following questions in 1-2 paragraphs. Excessive length will not dock you marks, but **is not** encouraged.

5)
In *Global Warming Gridlock*, Victor Heller describes the "Engineer's Myth" - that invention of new technology follows an easy path to implementation. In reality, new technologies face a

steep slope and long time horizons to full deployment, and history is littered with abandoned technologies. Explain why this is the case with at least three (3) supporting arguments.

6)
Do you believe that climate change globally exacerbates issues of inequality and social justice? For full marks, defend your position with four (4) concrete reasons/examples.

7)
Define Maniates meaning of the term 'individualization' in regards to climate change. What is the linkage between individualization, neoliberalism, and consumerism. Give two (2) examples of how global warming is 'individualized' in today's society, and one (1) example of how to make the problem 'collective' or 'institutional.'

1)
True (2)
False (2)
Market Liberals, Social Greens, Bioenvironmentalists, Institutionalists (4)

2)
- Technology can shape political arrangements through deliberate social arrangement. For example, the choice of low clearance tunnels in Long Island, New York in the 50s and 60s prevent busses from travelling these roads. Therefore only high income, predominantly white families were able to move to these areas. (2)
- Technology can shape political arrangements through inherent properties of the technology itself. An example is nuclear weapons - there existence creates the requirements for strong central authorities to safeguard them. Another example - distributed renewable energy gives increased power and autonomy to communities, reducing their reliance on centralized energy providers. (2)
- Examples (2)

3)
- Carbon tax systems are based on setting a price limit on carbon (1)
  - Where the carbon tax is applied can change - supply, distributer, consumer (1)
- Cap and Trade systems set a limit on the allowable carbon emissions (1)
  - Auction off permits to release a certain amount of carbon credits (0.5)
  - Surpassing the limit means responsible parties purchase carbon credits (0.5))
- In carbon tax there is a fixed economic value on carbon and in cap&trade the value of carbon is relative to the carbon limit, amount of credits, price of offsets, and timeline for limit reduction/offset valuation (2 - for how it reduces carbon/the key point to me is the relativity of carbon's value in the second system)

4)
- NDC = Nationally Determined Contribution = The greenhouse gas emissions targets of the parties of the Paris Agreement. (2)
- NDCs are decided individually by each nation and are submitted to the UNFCCC every 5 years. (2)
- Economically developed countries are expected to have more ambitious targets than developing countries "in light of national circumstances." (0.5)
- NDCS are supposed to become more stringent with each iteration. (1.5)

5)
- Engineer's myth restatement (2)
- 3 supporting arguments (6, 2 each)
  - Invention is a small phases in the process of technology deployment: Invention>Demonstration>Diffusion>Maturity.

- ○ What matters is not just the technology, but the markets, infrastructure, and policy systems surrounding it. New technologies either need to fit into or establish new market systems to arise and spread effectively.
  - ○ New technologies must be scaled to reduce their cost.
  - ○ New technologies must compete with incumbent industries and established technologies - these industries are invested in maintaining their dominance and can have significant political clout.
  - ○ There is a slow turnover rate of technologies because of the requirements for investment.
  - ○ It is difficult to predict the long term developments in technology.
- Example (2)
- Grammer/Flow (2)

6)
- Statement of opinion (2)
- 4 concrete reasons/examples of social justice issues (8, 2 each)
  - ○ Economically developed countries have disproportionately contributed greenhouse gas emissions that are the cause of climate change.
  - ○ Poorer people generally lack access to protective services (e.g. air conditioning, insurance, etc.)
  - ○ Marginalized and working class populations are often more at risk from the impacts of climate change - (e.g. women who are responsible for gathering food and water for their families, indigenous people whose lives are closely tied to the land, workers who are more susceptible to increased temperatures)
  - ○ Coastal nations and low-lying island nations threaten to go underwater by the end of the century, displacing people who live there and creating climate refugees.
  - ○ Environmental issues (e.g. droughts and floods) could reduce the supply of food in a growing world. Prevalence of malnutrition in low-income countries could increase if food is scarce.
  - ○ Impacts of climate change (e.g. food shortages, extreme weather, forced migration) are likely to increase violence including war, state-sponsored violence, and organized crime.
  - ○ Impacts of climate change and a lack of individuals' ability to address it can lead to increase
  - ○ Environmental and health consequences of climate change disproportionately affect low-income countries and poor in high-income countries.
- Grammer/Flow (2)

7)
- Maniates definition (2)
  - ○ Individualization = the philosophy that individual choice is the way that we will avoid global warming - people will choose to buy clean energy, electric vehicles,

green products, etc. because it is the right thing to do. Education about environmental problems improves the choices that people make. "knotty issues of consumption, consumerism, power and responsibility can be resolved neatly and cleanly through enlightened, uncoordinated consumer choice."

- Link between individualization, neoliberalism, and consumerism (4, 2 for each link)
    - Individualization gets away from thinking about the problem collectively or institutional - "Institutional thinking calls for individuals to understand themselves as citizens in a participatory democracy first, working together to change broader policy and larger social institutions, and as consumers second."
    - Individualization is a neoliberal tactic that engages consumers to try to solve the market problem while expanding the economy. Individualization is the antithesis of institutional market intervention, which is the philosophy of neoliberalism. Individualization promotes consumerism by having consumers buy 'eco-friendly' products
- 2 Examples of how global warming is individualized (2, 1 for each example)
    - Individualization examples: Buying an electric car, buying green electricity, buying 'eco-friendly' products at the supermarket, going vegetarian, refusing a straw, etc. - even putting a price on carbon because that just comes down to fossil energy being more expensive for the consumer.
- 1 example of making the problem collective/institutional (2)
    - Institutionalization examples: Creating a government system for clean energy expansion, imposing limits on the sale of fossil fuels, clean public transportation systems for all.
- Grammer/Flow (2)