I expect you to consult the sources linked from the course page (including the slides). If you consult any other source, please take care to cite it, ideally as a URL that I can follow.

If you make assumptions about any problem, state them, but be prepared to justify why they were necessary.

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<td>Points:</td>
<td>14</td>
<td>12</td>
<td>20</td>
<td>26</td>
<td>10</td>
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This exam has 6 problems, for a total of 100 points.

1. (14 points) Identify all of the following statements that are true about the argumentation.
   A. According to Besnard and Hunter’s definitions (based on Toulmin), a warrant of an argument is the general rule that justifies its claim or conclusion
   B. According to Besnard and Hunter’s definitions (based on Toulmin), the backing is a justification for a warrant
   C. According to Besnard and Hunter’s definitions, it is possible for an argument to rebut itself
   D. According to Besnard and Hunter’s definitions, it is possible for an argument to undercut itself
   E. Loosely following Walton’s descriptions, in a persuasion argument, the burden of proof falls upon the (would be) persuader
   F. According to Walton, the precautionary principle applies in a setting where we consider an action that might be risky or difficult to undo; the principle places the burden of proof upon advocates of that action
   G. Loosely following Walton’s descriptions, the precautionary principle corresponds to an Argument from Negative Consequences

2. (12 points) Of the following statements, identify all that hold about organizations, sociotechnical systems, or norms.
   A. A stakeholder is someone who is an active participant within a system
   B. In a sociotechnical system in our conception, a stakeholder is a principal
   C. An organization may have a life time distinct from all its members
   D. A major feature of a norm in our conception is that it clarifies who is accountable for whom and for what
   E. The challenge of dealing with prohibitions arises from our need to accommodate closed systems where principals simply cannot violate any given norm
   F. A power corresponds to the capabilities a principal has based on the resources or skills it possesses

3. Recall Kornhauser and Sager’s notion of the Doctrinal Paradox in which they consider a set of Boolean propositions (both premises and conclusions) on each of which individual judges render an opinion.
   The task of this problem is to generalize Kornhauser and Sager’s concept to a situation where the propositions are not Boolean, specifically, for the following scenario. For example, a proposition under consideration by the European Union might concern the crisis in Ukraine as follows:
   - A country may annex a region of another country provided a majority of the populace of the target region wants to be annexed (as determined in a referendum)
     - Anytime: call this W for wants
     - Only if no foreign military is present: call this F for freely
     - Only if the referendum is held one year after it is announced: call this Y for year
• A country may legitimately send in its military into another country
  – If there is a threat of an imminent attack: call this T for threat
  – If it already has a military base in the target country that it might need to protect: call this B for base
  – If it needs to protect people of a particular ethnicity from potential harm: call this P for protection

Let’s say we have three possible decisions.

• Sanction Russia heavily (H)
• Sanction Russia mildly (L)
• Don’t sanction Russia (N)

(a) (8 points) Specify a doctrine that would potentially produce each of the possible decisions as its outcome.
   You can think of this as a switch that produces a possible decision given values of the premise attributes.

(b) (12 points) Suppose each European Union member country reveals its ranked assessment of the premises.
   Suppose we use Borda counts throughout. Describe a scenario that illustrates the Doctrinal Paradox. Feel free to limit your scenario to as few as five countries.

4. (26 points) Consider the first of the proofs of Arrow’s Theorem given by Geanakoplos—this is the proof we discussed in class.
   Develop a concrete example of this proof that involves four alternatives. In your example, use Single Transferable Vote as the voting method and choose as many voters as you need (the fewer the better).
   Come up with concrete sets of ballots corresponding to the main steps in the proof. Specifically, the set of ballots you propose for Profile I should map the set of ballots you propose for Profile II in the way described by Geanakoplos. Include all the various profiles Geanakoplos mentions in his proof.

5. (10 points) Consider a scenario involving three parties, namely, Alice, Bob, and Charlie. Consider three messages: to be sent from Alice to Bob, Bob to Charlie, and Charlie to Alice.
   Describe the commitment operations associated with each message such that when each message has been received, each party’s social state includes the same commitments.

6. (18 points) Consider the principles motivated to achieve the alignment of commitments, namely, NOVEL CREATION, COMPLETE ERASURE, and ACCOMMODATION.
   Propose definitions of these principles that are geared toward prohibitions rather than commitments.