14% of final grade, (17 points graded out of 15)

1) Multiple Choice
   i) Consider this problem and the conclusion provided

   If it is foggy, flights out of SFO are delayed;
   Flights are delayed
   Thus, It is foggy.

   a. Deny the Antecedent
   b. Affirm the Antecedent
   c. Deny the Consequent
   d. Affirm the Consequent

   ii) Making a decision based on ease of retrieval of relevant examples from memory. This is an informal approach that can be extremely useful in many situations, but which sometimes produces the wrong answer.

   a. Representativeness
   b. Bayes Theorem
   c. Availability
   d. Algorithm

2) Using Technical terms, Describe what Luchin's (1942) "Water Jug Experiment" (as discussed in class and in the text) illustrates AND how it illustrates it.

3) Identify four characteristics of "CREATIVE INDIVIDUALS" (as discussed in class and/or the text)
   i) High in motivation.
   ii) Experts in domain.
   iii) Deep belief in value of their work.
   iv) Self-critical.

- Insightful & divergent thinking
- Etc.
4) Consider the following

   i) Recursively getting closer and closer from the current state towards the solution state illustrates this kind of problem solving:
      (1) Working backwards
      (2) Ill-defined
      (3) Means-end [Working Forward]
      (4) Conjunctive

   ii) The kind of problem solving described in (i) [above] is more likely to be used by:

      a) Experts
      b) Novices
      c) Brilliant Hans, the wonder horse
      d) Tolman's rats

5) Define (and provide an example) of each

   i) Conditional Reasoning

      IF P THEN Q
      EVIDENCE
      CONCLUSION

      (You must also show an example)

   ii) Syllogistic Reasoning

      SOME A/B/C/N non-A
      MAJORITY PREMISE
      MINORITY PREMISE
      CONCLUSION

      (You must also show an example)

6) Identify the four constituent elements of a well-defined problem

   i) Goal States
   ii) Subgoals
   iii) Operators
   iv) Problem Space, could be one or
       Initial (current) State, could be one or
7) Define each
   i) Heuristic
      Rule of Thumb
   ii) Problem Space
      All possible states (problem solving)
   iii) Deduction
      General → Specific
   iv) Subjective Probability
      Overestimate low freq. (v; objective probability)
      Underestimate high freq.
   v) Utility
      "Value"

8) Define (and provide an example) of each
   i) Euler Circles
      Used to help w/ syllogism
      [Human mortals (gods)]
   ii) Gambler’s Fallacy
      "Law" or small numbers... ("Karma")
   iii) Functional Fixedness
      Intended use only
   iv) Atmosphere Hypothesis
      Some or all → Valid in syllogism
   v) Halo Effect

9) Define (and differentiate) "Productive" thinking versus other approaches.
10) Consider which card or cards would you turn over to obtain conclusive evidence about the following rule for a set of cards with a number on one side and a letter on the other: An even number will have a consonant on the flip side. Circle the relevant letters / numbers that you would need to check.

```
A  2  D  7
 NOTC  E  NOTC  NOT E
```

11) What are the two logical fallacies associated with conditional reasoning in the Wason card task? (i.e., what are the technical terms for the two kinds of logic failures that people engage in when they make mistakes on the Wason card task? [the task is exemplified in the earlier question])

```
ilicit conversion
belief bias
```

12) Identify four ways in which EXPERTS differ from NOVICES

i) **More knowledge**

ii) **Better knowledge**

iii) **More inter-converted knowledge**

iv) **Experts spend more time (90% of time) setting up**

v) **Experts more likely to work forward**

vi) **Experts more likely to see deep structure**
13) Identify three different overall perspectives on Creativity

I) How much
II) Experience
III) Personality

14) Why does an understanding of "base rate" and "base rate neglect" lead to the rejection of the idea that people are rational decision makers? (this question is primarily about your understanding of what these two terms mean). It may help to provide an example.

Likelihood in population.

Ignored % in population (e.g., As a result of Availability or Representativeness)

15) Describe one experiment used to investigate "insight" learning AND describe the results/conclusions of the experiment.

Computer program.

Data showed continuous improvement.

But ratings of feeling close showed my "Ah-Ha" moment.
16) List an additional 4 ways in which to improve problem solving (as discussed in class)
   a) Increase domain knowledge
   b) Change the problem representation
   c) Automate some components
   d) Follow a systematic plan
   
   e) Inferences (draw)
   f) Work backwards
   g) Search contradictions
   h) Search relations
   i) Practice (!)

17) Describe an example of the "Simulation Heuristic". Define the Simulation Heuristic and two other related terms.