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; ← CONSEQUENT
Flights are delayed ← EVIDENCE.
Thus, It is foggy.

   a. Deny the Antecedent
   b. Affirm the Antecedent
   c. Deny the Consequent
   d. Affirm the Consequent ← NOT VALID

   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.

NEGATIVE SET / FIXATION

~ ONE KEEPS TRYING previously SUCCESSFUL APPROACH THAT NO longer WORKS.

~ PRIOR EXPERIENCE => INABILITY to solve PROBLEM

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

   - INSIGHT & 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
(4) conjunctive

(WORKING FORWARDS)

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

(I WON'T ASK THIS QUESTION IN THIS MANNER)

5) Define (and provide an example) of each

i) Conditional Reasoning

IF P THEN Q.
EVIDENCE
CONCLUSION.

(YOU MUST ALSO SHOW EXAMPLE)

ii) Syllogistic Reasoning

SOME/ALL/NONE MAJOR PREMISE
MINOR PREMISE
CONCLUSION

(YOU MUST ALSO SHOW EXAMPLE)

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

i) GOAL STATE
ii) SUBGOALS
iii) OPERATORS
iv) { PROBLEM SPACE } COULD BE ONE OF
{ INITIAL (CURRENT) STATE } COULD BE ONE.

7) Define each

i) Heuristic

Rule of thumb

ii) Problem Space

All possible states (problem solv)

iii) Deduction

general → specific

iv) Subjective Probability (vs OBJECTIVE PROBABILITY)

OVERESTIMATE LOW PROB.
UNDERESTIMATE HIGH PROB.

v) Utility

"VALUE"

8) Define (and provide an example) of each

i) Euler Circles

Used to help w/ syllogisms

ii) Gambler's Fallacy

"LAW" OF SMALL NUMBERS... ("KARMA")

iii) Functional Fixedness

INTENDED USE only

iv) Atmosphere Hypothesis

SOME OR ALL → VALID IN syllogisms

v) Halo Effect

1 element of knowledge ⇒ generalized TO UNRELATED

9) Define (and differentiate) "Productive" thinking versus other approaches.

EITHER

(A) Kohler's Monkeys

"NEW WAY OF STRUCTURING ELEMENTS"

(vs. Reproductive)

OR

(B) How much you produced (Torrance)

vs.

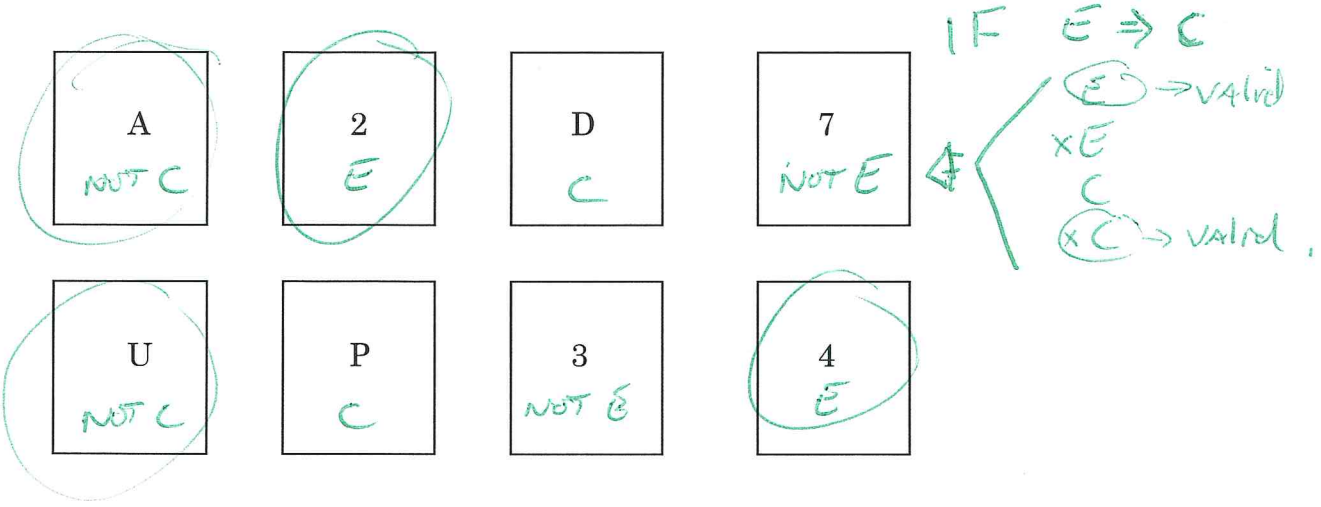
Expected/committment (Wertheimer)

vs.

personality (Barron)

I WAS LOOKING FOR (A) Kohler Between Accept (B)

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.



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])

ILLICIT CONVERSION

BELIEF BIAS

12) Identify four ways in which EXPERTS differ from NOVICES

i) More Knowledge

ii) Better Knowledge

iii) More INTER-connected knowledge

iv) Experts spend more time (% 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) Expertise

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.

Ignore % 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 programming.

DATA showed continuous improvement

BUT ratings of Feeling close

showed big "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.

SIMULATION

HINDSIGHT BIAS

UNDOING HEURISTIC