

Name: _____

Student ID: _____

Problem 1

(20 pts) Draw a truth table for the following statements and determine which are tautologies, which are contradictions, and which are contingent: $m \& \sim(m \vee n)$, $(m \& \sim m) \vee n$, $m \vee (\sim m \vee \sim n)$, $(m \& n) \vee (\sim m \& n)$.

Problem 2

(20 pts) Draw a truth table for the following propositions and determine if any of them are logically equivalent, and if any are mutually exclusive: $\sim e \vee (f \& \sim g)$, $\sim(e \& (\sim f \vee g))$, $(e \vee f) \& (e \vee g)$, $\sim e \& (\sim f \vee g)$.

Problem 3

(15 pts) Draw a truth table, and use it to determine whether the following argument is deductively valid: $p \vee \sim q$, $\sim p \& \sim(q \& \sim p)$, therefore q .

Problem 4

(15 pts) Rank the following arguments from strongest to weakest:

- (a) This is a fair six-sided die. We need a six to win. So we will win on this roll.
- (b) In clinical trials, 75% of patients who took this medication reported reduced symptoms within two weeks. Mark just started the medication. So Mark's symptoms will reduce within the next two weeks.
- (c) I've set my alarm for 7 am tomorrow, and I've used the alarm clock hundreds of times, and it's always woken me up. Also, I've been getting a good amount of sleep the past few days and have been waking up easily the past several days, and won't stay out late tonight. So I'm going to wake up by 7 am tomorrow.
- (d) I'm 13 points behind, and this is the last turn of the game. Whoever has the most points at the end will win. The only points I can gain will be the number that shows up on the dice on the next roll. The dice can only show a number up to 12. There's no way for my opponent to lose points. So I'm not going to win this game.
- (e) This restaurant gets an equal number of male and female customers. So the next customer will be female.

Strongest: _____, _____, _____, _____, _____: Weakest

Problem 5

(15 pts) Which of these arguments are based primarily on considerations about objective chance, which about frequency, and which based on other sorts of consideration?

- (a) Nate and Jessica and I are playing poker. Nate just raised the stakes in the game substantially, but I know he's not much of a risk-taker. So Nate must have a really strong hand.
- (b) We've shuffled the deck effectively and randomly dealt the cards. My hand has all four queens, and a king. So I'm going to win this hand.
- (c) We played 30 hands of poker last night, and I remember that Nate won 15 of them, and Jessica won 10, and I won 5. I only dealt one of them. That hand must have been one of the ones that Nate won.
- (d) In that hand where I had the four queens, I remember that I actually ended up losing to someone who had four aces! But Jessica says she never had a four-of-a-kind last night. So that must have been one of the hands that Nate won.
- (e) Jessica and Nate and I have played many games other than poker on many other occasions. So I'm sure we'll have another game night where we play a new game soon.

Primarily objective chance: _____

Primarily frequency: _____

Primarily other considerations: _____

Problem 6

(15 pts) [The actual midterm will ask one of the questions from the following list, and you will have to write a few sentences answering it.]

List of possible questions:

- Why does Hume think we can never have a deductive proof of the uniformity of nature?
- Why does Hume think an inductive argument for the uniformity of nature can never be convincing?
- What does it mean for an argument to be inductively strong, and how is this related to epistemic probability?
- What does it mean for an argument to be deductively valid, and how can truth tables be used to identify it?