24.111: Philosophy of Quantum Mechanics, Spring 2016
Practice Final Exam
(Note: the actual final exam will probably be slightly longer.)

1. The 'measurement problem' consists in the fact that the following is a valid argument:

   (A) "The dynamics is linear."

   (B) "The wavefunction is complete."

   (C) "Therefore, not all measurements have unique, definite outcomes."

   Explain why it is that, if (A) and (B) are true, (C) must be true (ie explain why this argument is valid).

2. Which of (A), (B), and (C) did Schrodinger take his "cat paradox" to show to be false? Why did he think it showed that?

3. Which of (A), (B), and (C) does Bohmian mechanics says is false? Why is that one false (in Bohmian mechanics)?

4. How does Bohmian mechanics "validate" the statistical algorithm? Answer this question specifically with respect to spin-at-90 degree measurements conducted on systems with spin-at-0 wavefunctions. (In your answer you should say what the statistical algorithm predicts about this experiment, and also say why, according to Bohmian mechanics, this is the right thing to say about the experiment.)

5. In general, what assumption do defenders of Bohmian mechancis make about "measurements" when they argue that, if Bohmian mechanics is true, measurements always have outcomes?

6. State, as clearly as you can, the "fuzzy link" in GRW.

7. Describe one problem for the fuzzy link; that is, one thing that GRW with the fuzzy link says can happen, that we ordinarily think cannot happen. You should not just say what this thing is; you should also explain why it can happen, if GRW with the fuzzy link is true.

8. What is the "Moderate View" of evidential support?

9. Present one argument that we discussed against the moderate view. Make sure the argument you present is a valid argument. Write your argument as a list with numbered premises and conclusion. Then, underneath, for each premise, articulate a reason to believe that premise.

10. Suppose someone offers you this deal: they will perform a stern-gerlach experiment at 0 degrees on a 90-up electron; if the outcome is "up," they will pay you one million dollars; if the outcome is "down," they will painlessly kill you. If the orthodox interpretation (or GRW, or Bohmian mechanics) is true, taking this bet is risking nonexistence. That's not so if the many worlds interpretation is true. Explain why.