Astronomy 311: *Quiz 3 Solutions*

1. PWF indicates the probability of finding a 'particle' at a certain position and time; the higher the wave 'peak', the better chance of finding it at that position at that time

2. (d)

3. (b)

4. (a)

5. T, T, F, F

6. before observation occurs, Copenhagen interpretation implies that a single reality does NOT exist; that is, the object exists in a superposition of all possible outcomes or states at the same time, or in the case of the cat thought-experiment, in the contradictory states of being both alive and dead at the same time! Many Worlds avoids this paradox by having all outcomes occur but in separate universes, so that each outcome is truly real and manifest (no superposition required). However, this comes at the cost of possibly requiring an enormous number 'parallel' universes to the one we actually experience

7. - light curve method: periodic changes in a star's brightness due to orbiting planet(s) passing in front of the star (mini-eclipses)
   - dimming yields planet size, duration gives orbital speed, frequency gives orbital period
   - very sensitive method, but requires an 'edge-on' system
   - best for large planets (blocks more light), but works even for smaller planets
   - takes some time to observe enough events to confirm a planet (eg. at least 3 repetitions)