Explanations for answers on Exam 1 A 2016

Scientific Method

1. 'decides … are bad' indicates a judgment or 'Evaluation'

2. 'develops an itchy rash' is not part of the process that stems from the goal. The goal is to get rid of the rash, so getting the rash was not part of solving it. Thus 'None'

3. 'Any of several … remedies will cure' is a hypothesis or 'Model' of how to achieve the goal.

4. 'shows full recovery' constitutes an observation or 'Data' regarding the success or failure of the models.

5. '3 different agencies.' In the context of the problem, these are the models that will be used for the goal of getting a job.

6. 'after 6 months' has no part in the process (None)

7. 'happiest with the agency' is an Evaluation of the 3 models (agencies)

8. '7, 3, and 2 interviews' are the observations relevant to the model here (Data).

9-12 were off a previous exam.

9. Yes. Since and evaluation compares a model to data, you cannot have an evaluation without both.

10. No. Might sound good, but data can exist regardless of whether they become part of an evaluation.

11. No. Recall the figure: if you accept the model, there is no revision in that cycle.

12. No. We don't prove things in science (emphasis on 'proof')

13 – 16. The paragraph describes a goal (good hair) and a model (using a stylist). Nothing else is mentioned. The fact that he/she (the question is gender neutral) never looked at the hair after the stylist finished means there are no data. And you cannot argue that the stylist may have told him/her what it was like, since that is not in the problem.

17 – 21. 'Accept' is a catch-all that means 'not rejected.' So all of these except one would qualify for a model being accepted. The one that does not is 18: being incompatible with the model is another way of saying reject.

Models

22-24. All of these may be true and could in principle be a reason that the clinical trial result does not apply to you. Maybe not likely to be a reason, but they in fact have all been reasons that clinical trial results were bad models of other groups of people

25-28. We are going from mice (where we have data) to humans (where we do not). Not only are mice different from humans, but the way that a mouse is getting venom (by a needle) and possibly the amount of venom differ from how (and how much) a human might get. Only 27 does not work. It is true that other snake species may have different venom compositions, but that is irrelevant to the question being asked (the goal) – predicting the consequences to a human of a bite from this species.

29-33. The goal determines how we are using mice. In 29, they are used for approval for public consumption, which implies humans. In 30, the goal is to treat cats, so mice are not used as models of humans. 31 may be a challenge because we are trying to trap mice in houses of people. But we are using mice as models of other mice. In 32, the goal involves humans, so

mice are models of humans. In 33, it's the same as in the mouse trap problem: mice are being used as models of other mice.

Condoms

34-36. A collection of condom testing model questions.

34. No. The ABT is weak on accuracy because it does not mimic the sex environment. Accuracy is about whether the model resembles what it is used for. Whether it measures pore size is irrelevant.

35. No. This follows at least from the fact that the ABT does not mimic sex.

36. Yes. When testing a subset of a batch to decide the fate of others in the batch, those tested are models of those not tested and vice versa. It goes both ways.

37-39. Yes, Yes, Yes. Since the goal is to test for marketing (people), and since all tests are used in making this evaluation, all are models of sex between people.

DWI

40-43. Models of establishing driver impairment. The 'road test' was mentioned briefly in the book and lecture as the most accurate model but not practical (not convenient).

40. Road test would be most accurate.

41. BAC is least accurate – measures nothing that directly matches driving ability

42. Least convenient is the road test – we cannot do it for safety reasons.

43. Greatest uniformity is the BAC – can be applied the same to everyone.

44-46. Here just testing your ability to know what A, C and U mean. Convenient means that it is easy to apply.

44. No. This criterion is the definition of accuracy.

45. Yes. This criterion does indeed mean convenient

46. No. This criterion means uniformity.

Extrapolations. Recall that extrapolations use data obtained under some conditions to guess (model) a response where there are no data.

47-49. 'harmless' strictly means no harm, so the only model that has no effect at low doses but harm at high doses is the threshold model. One might argue that the accelerating model also works here, but that was deliberately left out of the options.

50-53. The point here was that ALL of these models might apply when you only have data at high doses. That's why they were considered as alternatives.

54-57. Sadly, memorization.

54. No. Sounds good, but the problem is one of dose extrapolation.

55. No. You should have at least realized that a threshold model would mean that we don't care about second-hand smoke.

56. Yes. Guinea pigs were over 1000 times more sensitive than even other rodents.

57. No. Maybe the hardest to remember. The relationship is linear, but no longer an extrapolation – we observe it.

58-60. Gone over in class and help sessions in 2016. 58 and 59 are wrong because the data do indicate an increase in wear with tire age. 60 is right because the problem gives the data and does not use an extrapolation.

Themes

61. Yes. This was indeed a big point of the condom lectures.

62. Yes. Should be obvious from condom testing and DWI testing

63, 64. No. No. There is nothing about heading for a single model or the most accurate model. The most accurate model may be very inconvenient.