Explanations for answers to the 2012 exam 1(ab) in Bio301d

1. No, the distribution of responses was often the same across all years.
2. Yes – many questions had *some* students at both extremes. But most of these distributions had most students between the extremes.
3. Yes, especially when we got to statements that science cannot disprove (we cannot prove that something does not exist, such as communication with the dead).
4. We did not go into this one much in 2013, but the answer is no – we suggested that people use different criteria in making decisions, not that they do not understand the scientific method.
5. No. Not covered in 2013, but understanding nature is about evidence, not about first principles or being clever.
6. No. We presented several lines of evidence that our brains are NOT rational.
7. No. The theme is that it is broadly applicable without modification.
8. Yes. Not shown in 2013, although they are in Chap 1 of the book. And they were indeed used to reveal how many hazards we face and why we need a basis for rational decisions.

9 – 12. All true. If you can imagine gathering data that would answer the question, then the question could be studied. One difference in 2013 is that, for the first time, we noted that the scientific method should not be used to dictate morals, ethics, or values. However, you might well use the scientific method to evaluate what values and morals people have.

13-15. Here you are asked to identify components of the scientific method.

13. No. Evidence = data, not models.
14. No. Failure to change a model is absence of revision.
15. No. Other way around – cannot evaluate without data.
16. Yes – that is one of the fundamental properties of the SM.
17. Yes – use of evidence and turnover of models were the two shortcuts
18. No – the moment you see 'prove' your hackles should go up.
19. Yes – by definition.

20-24. Straight out of the book, although you can probably figure it out from first principles.

25-28. All elements are present in this short description. The goal is given, the models are his different plans, the data are his observations on traffic, evaluation is his judgment on an unacceptable rate of progress, and revision is his new route.

29-32. This paragraph is found on many previous exams, although the questions asked vary.

29. No. Revision is indeed absent, but it is not true that there can be no evaluation without revision
30. No. Models are not absent – they are the rules.
31. Yes. Evaluation would indeed be the testing of predictions (of the rules), and the problem indicates that such testing is absent.
32. Yes. First, data are indeed absent (= no formal observations); it is also true that evaluation cannot occur without data.

33-35. You will find this one on old exams.

33. Yes, just like a fire drill is a model of how you will evacuate.
34. No. "the performance in these drills was measured" is another example of data
35. No. "used to modify their plans slightly" is revision.

36-40. Not easy. Remember that data are observations to evaluate your model – observations that could cause you to reject it, for example.
36. No. The player statistics are actually part of your model. No set of player statistics could be used to reject
37. Ambiguous – could be considered data or not. Graded either way.
38. Technically no – they are part of your model. Graded either way, however.
39. No – part of your model.
40. Yes – these outcomes are the observations that will decide the success of your model (used for evaluation)
41. No – for your purpose of affecting the audience, the absence of biological material in the photo is irrelevant
42. Yes – to know if he had a genetic disease, you truly need biological material
43. Yes – that limitation is a serious one (we are ignoring the fact that the person next to you may be clueless)
44. Yes – omission of those 'hidden' costs is a big factor in the money you need for school.
45-49. We are asking here if the data enable you to evaluate the model – not whether the model should be accepted.
45. No – since your goal applies to smokers, survival rates of non-smokers are not applicable
46. Yes – the data would directly apply to the model evaluation
47. No – the goal specifically applies to you, but the data do not include you
48. No – you need to know whether they are telling the truth to evaluate the lie detector
49. Yes – the data apply directly to the model of 'increasing the odds'
50-53. Trained techs, mechanical tests, and the airburst test (which is a mechanical test) were strong on uniformity
54. Yes – we listed several goals, and they indeed overlap.
55. No – is not tied to breakage during use at all. We merely hope that breakage in the ABT applies to breakage during use.
56. Yes – evident from some of the tables we filled out in class.
57. No – we made no arguments about anything.
58. Yes – obvious from the fact that we got high breath concentrations that decayed rapidply
59. No – we did not use the demo that way, even though you might infer it
60. No – we did not use the demo that way, even though you might infer it
61. No – the accuracy of a BAC reading has nothing to do with whether it is an accurate model of driving performance. Accuracy is being used in 2 different ways here.
62. Yes. Given that the goal is to identify impaired drives, this is indeed a limitation. (The problem should probably have stated the goal.)
63. Yes. We covered this point, but you can also infer it. If you don't know how a person performs when sober, then you cannot evaluate whether they are impaired.
64. No. – also to assess mental faculties (by whether instructions are followed)
65. No – only need to fail one (not explained in 2013, however).

66. Linear model (A) – if you are assuming a constant rate of something, it means the linear model applies
67. Accelerating or threshold (B,C) – it means that things get progressively worse at higher doses
68. None (E) – there is no extrapolation when you have observations across the entire spectrum.
69. Linear (A) – multiplying dose by body weight is a type of proportionality
70. None (D) – there is no extrapolation here, although it seems like 'dose' might be right.
71. Dose (A) – the high dose given to rodents may be grossly misleading when extrapolated to lower doses, even in rodents
72. Species (B) – dioxin was over 1000 times more toxic in guinea pigs than even in other rodents, and we were misled to think it would be equally toxic in people.
73. Your exam will tell you what code to fill in. If you don't fill it in, you lose points.