

Regarding “None of These” Answers and Guessing

This exam employs a “safety check” against guessing affecting test scores. For example, if a hypothetical student knew nothing about any of the topics and simply guessed randomly on an exam having 20 multiple choice questions, each with five possible answers, (one of which was known to be correct), the student would be expected to score 20% (when in fact they should have had a score of 0%). Similarly, if a student actually knew how to correctly work half of the exams problems (10 problems) and randomly guessed on the other ten problems, the student would be expected to receive the grade of 60% rather than 50%.

One way to correct for this (employed on the SAT and similar exams) is to deduct additional credit when a student scores a wrong answer. For example, in the case of the student who got 10 right and 10 wrong, additional loss of credit would be deducted to compensate for “guessing”. In this case, it would be assumed the 10 wrong answers indicated that the student actually guessed at some of the 10 right ones (something we don’t really know) and deduct an additional $(0.2)(50) = 10$ points. Hence the score of 50% would be reduced to 40%.

This type of adjustment is only fair when students can eliminate some of the “really wrong answers” and guess “intelligently”. However, the problems typically asked on the progress assessment exams usually do not have “obviously wrong answers” since the types of problems being worked largely provide a numerical answer that must make physical sense. For example, suppose the exam asks a question about a drying operation where wet paper enters a dryer with a moisture content of 20% and leaves with a lower moisture content. Other problem data would allow for the calculation of the right answer and all answers provided will be less than 20%. If one of the answers was a negative number and one was great than 20% and one was greater than 100%, the remaining two “physically realistic answers” would allow students to have a 50% chance of getting the right answer even if they didn’t know how to correctly solve the material balances equations necessary to get the right answer.

The scheme used in the CHEN 2@@0 and CHEN 3@@0 exams is the same as is used in the MECH 2@@0 and MECH 3@@0 exams, namely, approximately one-fifth of the time, the correct answer is not included in the listed answers. Hence, the correct answer is “None of these”. When this situation arises, care is taken that there is a reasonable “clearance” between the listed answers and the right answer so that students can clearly determine that their “correct answer” is not listed.

For example, in a problem involving the yield of a reaction, the correct answer was “61.30” and the answers provided were (a) 54.2 (b) 122.6 (c) 30.65 (d) 108.4. This represents a “clearance” of 11.6%.

Another example requires calculation of the derivative of a function at a point. The correct answer was 1.26246 and the answers provided were (a) 0.552 (b) 12.624

(c) -0.552 (d) 0.0. This represents a “clearance” of 56%.

As a general rule, if you have correctly worked the problem (employed reasonable accuracy in looking up molecule weights and conversion factors and have carried sufficient decimal places in calculations) having an answer that differs by more than 5% should consider the answer “None of these” as the correct answer.