

**University of Toronto  
National Biology Competition**

**2011 Examination  
April 28, 2011**

**Answer Key**

1. b	11. b	21. a	31. a	41. c
2. c	12. c	22. - *	32. e	42. c
3. c	13. e	23. a	33. e	43. e
4. e	14. b	24. a	34. a	44. d
5. d	15. c	25. d	35. c	45. a
6. a	16. e	26. b, d *	36. b	46. b
7. a, d *	17. d	27. e	37. a	47. c
8. b	18. b	28. d	38. d	48. - *
9. e	19. d	29. b	39. c	49. e
10. d	20. - *	30. c	40. b	50. b

\* Comments on grading:

Adjustments were made to five questions: three questions (20, 22, 48) were removed from the April 28<sup>th</sup> version of the exam, and for two questions (7, 26) we accepted more than one response as being correct. We made these adjustments after considering the pattern of responses given by students and teachers. NOTE: A modified version of the exam was created on May 17<sup>th</sup>, where questions 7 and 26 each have one correct response (7a, 26d), questions 20 and 48 were removed, and question 22 was edited so there is a correct option (22b) of “primary xylem and primary phloem”.

Q7: Two responses (a and d) were accepted as being correct, as both cytokinin and auxin can delay ripening.

Q20: This question was unclear. If we had stated “chemically processed”, the correct response is (e), as carbohydrates and lipids are chemically processed in the mouth, as saliva contains both starch-digesting amylase and lipid-digesting lingual lipase (but no proteases).

Q22: The best response is “(i) primary xylem” and “(v) primary phloem”, however “i and v” was not one of the available options, so this question was deleted.

Q26: Two responses (b and d) were accepted as being correct, although (d) is the best response: spontaneous processes are classified by a negative  $\Delta G$  value, option (d) would yield a positive  $\Delta G$ .

Q45: The correct response is (a) “Interference of the production of dynein arms”. The word “dynein” was incorrectly spelled “dynein”, however this question was not deleted as nine of the top 10 students answered this question correctly.

Q48: This question was unclear, as “primary productivity” does not exist at higher trophic levels. If the question had been written as “Which of the following explains why productivity in a forest ecosystem decreases at higher trophic levels?”, then the best response is (i).