



AP[®] Biology 2002 Scoring Commentary Form B

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Question 1

Sample B (Score 9)

In part (a), a point was earned for the infection phase. A point was also earned for the interpretation of the populations reaching equilibrium, with an elaboration point for the description of a mutation preventing viral attachment.

Part (b) earned a point for the virus “anchoring to the bacterium,” a point for the insertion of the viral genome into the host cell, a point for the idea that viruses assemble inside the host, and a point for the elaborate description of lysis.

In part (c), a point was earned for the statement that retroviruses have an RNA genome and a point for the function of reverse transcriptase.

Sample C (Score 10)

In part (a), a point was earned for the description of the infection phase, a point for the dynamics of the bacterial growth, a point for the survival of resistant bacteria, and a point for dynamic equilibrium.

Part (b) earned a point for attachment and another for injection of DNA. A point is earned for the synthesis of the viral proteins, and a point for the break down of the cell membrane.

In part (c), a point was earned for stating that the genetic material of a retro virus is RNA and another for the function of reverse transcriptase.

Sample D (Score 6)

In part (a), a point was earned for exponential growth. In part (b), a point was earned for attachment to the host and another for injection of DNA. A point is also earned for the description of lysis.

Part (c) earned a point for RNA being the genetic material of the retrovirus and another for the function of reverse transcriptase.

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Question 2

Sample A (Score 10)

In part (c), which appears first, the student earned a point for correctly labeling the X and Y axes and another for the appropriate relationship between the control and experimental groups.

In part (a), a point was earned for chemoreceptors and baroreceptors sensing CO₂ concentration and blood pressure. Another point was earned for the sympathetic nerves stimulating the SA node. A point was earned for the increase in heart rate and another for the increased blood flow.

Part (b) earned a point for describing how the heart rate would be measured and a point for the parameter of the protocol (changing speed and inclination of the treadmill). In one sentence, the student earned the point for excluding other variables and describing the control. Another point could have been earned for the prediction of results, but the paper had attained the maximum score of 10.

Sample S (Score 8)

In part (c), which appears first, the student earned a point for correctly labeling the X and Y axes and another for the appropriate relationship between the control and experimental groups.

In part (a), a point was earned for the sympathetic nervous system increasing heart rate and a point for bronchial tubes expanding to accommodate heavier breathing.

Part (c) earned a point for excluding other variables and a point for saying how the heart rate would be monitored. A point was earned for the prediction of results and a final point for specifying multiple repetitions.

Sample T (Score 6)

In part (c), which appears first, the student earned a point for correctly labeling the X and Y axes and another for the appropriate relationship between the control and experimental groups. A third point was earned for appropriately specifying units on the axes.

Part (b) earned a point for the hypothesis and another for the protocol. The final point is earned for specifying multiple trials.

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Question 3

Sample R (Score 10)

A point was earned for tubulin for the structure being a protein and another for the alpha and beta forms. A third point was earned for the function of tubulin in microtubules, and an additional point was earned for the role of these in mitosis.

A point was earned for cellulose for a polymer of beta glucose and another for the straight, unbranched, structure. An additional point was earned for the structural component of the cell wall.

For mRNA, a point was earned for nitrogen base composition and another for being composed of nucleotides. The final point was earned for attachment of the ribosomes to translate the genetic information.

Sample S (Score 8)

A point was earned for tubulin for the protein nature of the molecule and another for the structure of the microtubule. A further point was earned for the description of the role of microtubules in helping to move organelles around the cell.

A point was earned for cellulose for the carbohydrate nature of the molecule and another for the component of the cell wall.

For mRNA, a point was earned for sugar-phosphate-base composition and a point for the 5' to 3' orientation. The final point was earned for discussing post-transcriptional processing.

Sample T (Score 6)

A point was earned for tubulin for the protein nature and a point for the structural component of microtubules. A third point was earned for the role of microtubules in the movement of organelles.

A point was earned for chitin for being a component of arthropod "armor."

For mRNA, a point was earned for the nucleotide composition of the molecule and another for the nitrogen bases. The remaining lengthy discussion did not earn additional points.

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Question 4

Sample R (Score 9)

A point was earned for identifying the three germ layers, a point for the fate of the ectoderm, and a point for the fate of the mesoderm. A point was earned for acoelomates having no body cavity and the appropriate example of the flatworm. Another point was earned for the description of the coelomate and the appropriate example of humans. An additional point was earned for the description of the pseudocoelomate and the appropriate example of the nematode (misspelled). A point was earned for extracellular digestion in both, and another for the coelomate specialized digestive system. The two-way nature of the acoelomate gut is stated in a way that is too confusing to earn a point, but a point was awarded for the elaboration of the complete digestive tract, including specific enzymes.

Sample S (Score 8)

A point was earned for identifying the three germ layers, a point for the fate of the ectoderm, and a point for the fate of the mesoderm. A point was earned for acoelomates having no body cavity and the appropriate example of the flatworm. An additional point was earned for the description of the pseudocoelomate and the appropriate example of the nematode. Another point was earned for the description of the coelomate and the appropriate example of annelids. A point was awarded for the one-opening nature of the acoelomate digestive cavity, and another for the contrast in specialization between coelomates and acoelomates.

Sample T (Score 6)

A point was earned for identifying the three germ layers and a point for the fate of the ectoderm. No point could be awarded for mesoderm becoming muscles, because it was paired with mesoderm becoming the spinal cord and nervous system. A point was earned for acoelomates having no body cavity and the appropriate example of the flatworm. Another point was earned for the description of the coelomate and the appropriate example of the segmented worm. An additional point was earned for the description of the pseudocoelomate and the appropriate example of the roundworm. A point was awarded for the contrast in specialization between coelomates and acoelomates. The remainder of the answer seems to confuse deuterostome/protostome with coelomate/acelomate, and earns no additional points.