QUESTION 67
The cytotoxic effect of chemotherapeutic agents in some tumours is defined by first order kinetics. The best explanation for this is that these agents:
A. kill a higher number of cancer cells with prolonged exposure.
B. kill a constant fraction of cancer cells.
C. kill a constant number of cancer cells.
D. undergo first pass metabolism in the liver.
E. undergo intracellular metabolism.

First-order kinetics, when applied to the concept of cytotoxicity, means that the drug will kill a constant proportion of tumor cells (rather than a constant number). The log kill hypothesis refines this by stating that the magnitude of killing by a cytotoxic agent is a logarithmic function. Therefore, a drug producing a 3-log kill will reduce 1012 cells to 109, or will reduce 106 cells to 103 (three orders of magnitude in either case). This hypothesis accounts for the far better results observed with chemotherapy when the total tumor burden is low. The half-life of the drug does not determine the number of cells killed, assuming an adequate dose is given.

Answer B