Print Name _____

Biol 114.02
Quiz 6
Spring 2007

- 4 questions on 4 pages, including this cover sheet. Note that some questions have multiple parts.

- This is a take-home quiz. You may use your text, classnotes, webnotes, journal articles, the NY Times, the internet, etc. to complete it. You may NOT enlist the help of other people in or out of our class, on or off campus.

- The quiz is due at **the beginning of class on Monday, March 26**. Submit it to Dr. Slonczewski. Late quizzes will not be accepted.

- STAPLE all pages together! Do this before class, since there is typically no stapler in Higley Auditorium.

- Sign your name below to indicate that you understand and have faithfully complied with these rules.

Signed _____

1. [1 point] Which of the following sets of primers could you use to amplify the target DNA sequence indicated by the dots. The dots represent a 750 bp stretch of DNA. Indicate your choice(s) by circling the letter corresponding to a pair of primers. 0, 1, or more choices may be correct.

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5'-GGCTAAGATCTGAATTTTCCGAG . . . TTGGGCAATAATGTAGCGCCTT-3'
3'-CCGATTCTAGACTTAAAAGGCTC . . . AACCCGTTATTACATCGCGGAA-5'
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A) 5'-GGAAAATTCAGATCTTAG-3' and 5' TGGGCAATAATGTAGCG-3'

B) 5'-GCTAAGATCTGAATTTTC-3' and 3'-ACCCGTTATTACATCGC-5'

C) 3' –GATTCTAGACTTAAAGGC-5' and 3'-ACCGTTATTACATCGC-5'

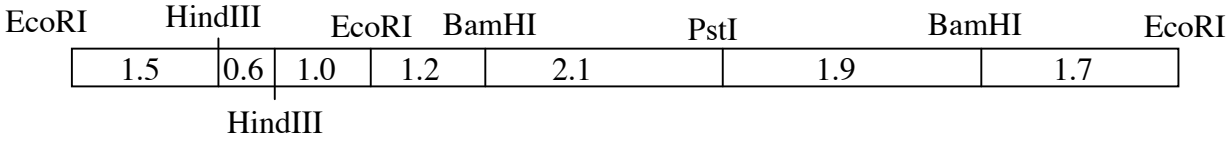
D) 5' – GCTAAGATCTGAATTTTC-3' and 5'-TGGGCAATAATGTAGCG-3'

E) None of the above.

2. [2 points] ddCTP is a useful compound for DNA sequencing reactions. It is also used as a chemotherapeutic agent for cancer patients.

Draw the *complete* structure of ddCTP.
Concisely explain why ddCTP might be useful killing cancer cells. How does it work? *Use no more than four sentences in this explanation.*

3. [3 points] Restriction Enzyme Mapping Problem



The diagram above depicts a restriction map of a cloned 10 kb piece of DNA. Cut sites of various enzymes are indicated above or below the DNA fragment. The size of the DNA between each site is indicated in kilobasepairs (kb). Note that this is a linear DNA, not a circle.

In different test tubes, this linear DNA fragment was cut with each of the enzymes or combinations of enzymes listed:

i) EcoRI

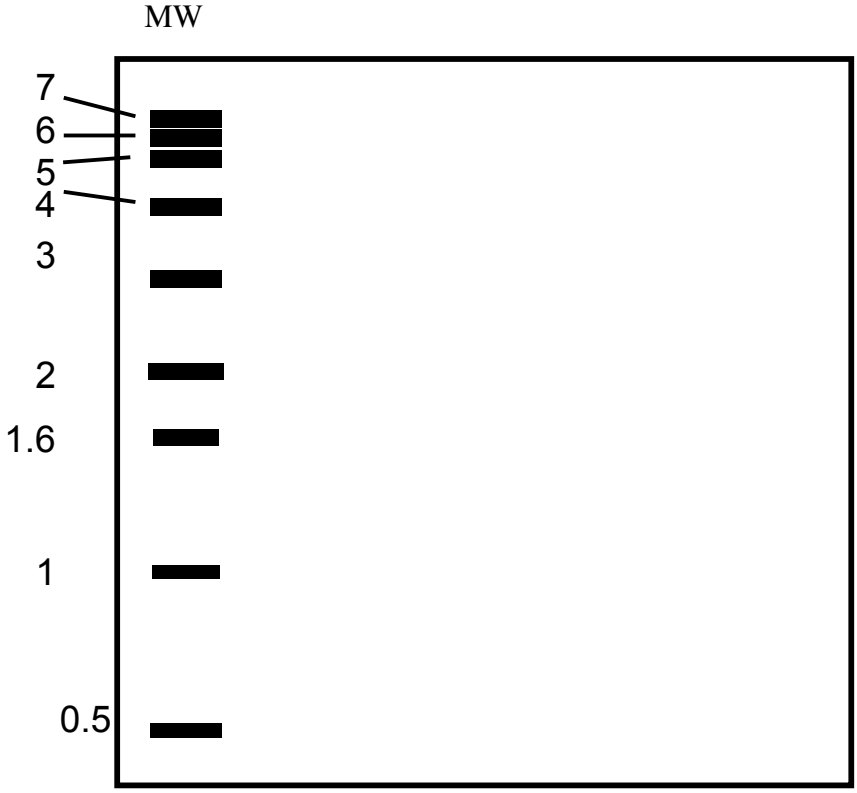
ii) BamHI

iii)EcoRI + HindIII

iv)BamHI + PstI

v) EcoRI + BamHI

Indicate the mobility of the fragments generated in the cuts on the agarose gel at left. Be sure to clearly label which reactions were loaded in which lanes. Sizes (in kb) and mobilities of molecular weight markers are indicated at the left of the gel. You can write the size of each fragment beside its image, if you like.



4. [4 points] **Dianabol** (a.k.a Methandrostenelone) is an anabolic steroid used by athletes (especially professional baseball players) and bodybuilders to increase muscle mass. One might hypothesize that Dianabol causes increased transcription of the gene encoding *muscle myosin*, a major component of muscle. This would cause increased production of myosin mRNA and myosin protein.

How could you test this hypothesis using cultured muscle cells? To answer this question, do the following:

- **Name and describe** TWO techniques that would be useful for such an experiment.
- Be sure to list the specific items and reagents you would need for each.
- Draw a picture of the data that would result IF Dianabol does indeed increase expression of muscle myosin.

Please be sure to make each portion of your answer easy for me to find and grade.

Technique #1: _____

Items needed to do this:

Data:

Technique #2: _____

Items needed to do this:

Data: