1. The “shotgun approach” involves:

a. Sequencing of randomly isolated DNA fragments to determine a genome sequence
b. Microprojectile bombardment of recipient cells with gold particles that are coated with donor DNA as a means to achieve gene transfer
c. Random screening of hundreds of thousands of colonies to detect the few colonies containing mutations within the desired gene
d. Shooting cells with high energy electrical pulses to enhance competence.
e. Targeting an old Micro exam with a 16 gauge as a means to deal with frustrating questions.

2. *Bacillus anthracis* has roughly the same size genome as *E. coli*. This corresponds to about _____ total base pairs encoding about _____ genes.

a. 50,000,000 bp and 50,000 genes
b. 5,000,000 bp and 5,000 genes
c. 500,000 bp and 500 genes
d. 50,000 bp and 5000 genes
e. 5,000,000 bp and 500 genes

3. Assume that the *manA* gene, required for metabolism of the sugar mannitol, is regulated by a mechanism involving an inducer:activator complex where mannitol is the inducer. Which of the following statements is true?

a. Binding of mannitol to the activator turns on transcription of *manA* as the complex stimulates RNA polymerase to bind near the start of the gene.
b. Binding of mannitol to the activator turns off transcription of *manA* as the complex stimulates RNA polymerase to bind near the start of the gene.
c. Binding of mannitol to the activator turns on transcription of *manA* as the complex causes RNA polymerase to dissociate from near the start of the gene.
d. Binding of mannitol to the activator turns off transcription of *manA* as the complex causes RNA polymerase to dissociate from near the start of the gene.
e. Mannitol induces diauxic growth when used as the sole carbon source.

4. The genome from which type of virus is capable of acting as messenger RNA immediately after infecting the host without any additional nucleic acid synthesis

A. a double stranded DNA virus
B. a single stranded (-) DNA virus
C. a single stranded (+) DNA virus
D. a single stranded (-) RNA virus
E. a double stranded RNA virus