BLINKOVA **MIC 226 FALL 97 EXAM 4**

READ THE QUESTIONS CAREFULLY AND THINK THROUGH ALL THE ANSWERS. CHOOSE THE BEST ANSWER.

1. Temperate phages have genes for
   a. enzymes
   b. capsomeres
   c. repressors
   d. all the above

2. Site - specific recombination is similar to homologous recombination because
   a. enzymes are required in both
   b. recombination proteins recognize a certain sequence of nucleotides in both DNA molecules
   c. single strands of DNA participate in both
   d. both are required in binary fission

3. Homologous recombination between two double stranded DNA molecules requires which order of events (from left to right).
   a. pairing of two chromosomes to form a four stranded structure, action of recombination enzymes to separate the four strands into two double stranded molecules.
   b. generation of circular molecule, nicking of one strand for transfer to the recipient
   c. formation of a single stranded fragment with a 3' end, invasion of double stranded molecule by the 3' end of the fragment.
   d. DNA ligase action to generate a partially single stranded fragment of DNA, invasion of double stranded molecule by the single stranded fragment

4. Transformation in bacteria
   a. is the transfer of DNA from one bacterium to another by use of a phage
   b. is able to convert mutants into wild-type organisms
   c. is a primitive sexual mechanism dependent on the fertility factor
   d. is limited to genes adjacent to prophage attachment sites

5. DNA ligase is an enzyme which
   a. joins 5' phosphates in DNA strands with 3' hydroxyl groups in an adjacent DNA strand
   b. participates in forming lysogens
   c. functions in transformation by chromosome fragments
   d. all the above

6. Generalized transducing particles
   a. package chromosomal fragments after infecting the donor
   b. are formed during lytic growth of a phage in a bacterial host
   c. carry donor genes to recipient cells
   d. all the above

7. Formation of generalized transducing particles
   a. requires transformation
   b. takes place during phage growth
   c. is limited by restriction
   d. is inhibited by repressor

8. The phenotype expected of a transductant which received the wild-type leucine biosynthesis gene from a donor would be
   a. ability to catabolize leucine and, therefore, to grow on medium containing leucine as the sole carbon sourse
   b. ability to catabolize leucine and, therefore, to form colonies on medium containing glucose as the sole carbon source
   c. ability to synthesize leucine and, therefore, to grow on medium containing leucine
   d. ability to synthesize leucine and, therefore, to grow on medium contain glucose as the sole carbon source

9. In bacteria, plasmids can be transferred from one cell to another by
   a. conjugation
   b. deletion
   c. restriction
   d. all the above

10. Restriction in bacteria
   a. is a mechanism to add a chemical marker to "self" DNA
   b. generates fragments incorporated into transducing particles
   c. depends on enzymes
   d. inhibits males from mating with males

11. Plasmids which can be transferred by conjugation
   a. contain transfer genes
   b. code for restriction enzyme(s)
   c. contain restriction sites
   d. all the above

12. Insertion sequences
   a. are sites for restriction enzymes
   b. are origins of transfer
   c. are mobile, linear pieces of DNA
   d. all the above

13. Conjugation
   a. is one example of a mechanism of transferring DNA from one cell to another
   b. involves male and female cells
   c. does not necessarily require homologous recombination
   d. all the above

14. DNA restriction
   a. is the breaking of double stranded DNA at specific nucleotide sequences
   b. preceeds plasmid DNA transfer in conjugation
   c. cuts the chromosome to form transducing phage particles
   d. all the above

15. DNA which is the target for molecular cloning
   a. has to be extracted
   b. has to be cut with a restriction enzyme
   c. has to be ligated to a vector
   d. all the above