

Course No: BIPH 2315  
Course Title: Pharm. Biotech.  
Date: 14/03/2018  
No. of Questions: (4)  
Time: 1 hours  
Using Calculator (No)

University of Palestine



1<sup>st</sup> Exam For 2<sup>nd</sup> Sem.  
2017/2018  
Total Grade:

Instructor Name: Dr. Iyad ALQOUQA  
Student No.: \_\_\_\_\_  
Student Name: \_\_\_\_\_  
College Name: Pharmacy/Biotech.  
Dep. / Specialist: \_\_\_\_\_  
Using Dictionary (No)

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**Question One:**

**12 Marks**

**Select and encircle the appropriate answer of the following:**

**1. Molecular cloning requires**

(a) Competent host cells (b) Vectors (c) Restriction endonucleases (d) All of the above

**2. Restriction Endonucleases are**

(a) Endogenous bacterial enzymes (b) Produced by plants for self-defense (c) Man-made Enzymes (d) Nutrients for bacteria

**3. Plasmids are used to clone fragments**

(a) That are 35–50 kb in length (b) Less than 15 kb (c) 100 kb (d) 350 Mb

**4. cDNA library contains**

(a) Reverse-transcribed RNA (b) Genomic DNA fragments (c) Exons (d) 3' UTRs

**5. The limitation of *E. coli* which poses a problem for recombinant protein production is:**

(a) Codon biasing (b) Splicing (c) Posttranslational modification (d) None of these

**6. Which of these restriction enzymes produce blunt ends?**

(a) HaeIII (b) Not-I (c) EcoR1 (d) BamH1

**7. In order to insert a foreign DNA into plasmid, both must:**

(a) Originate from same cell type (b) Have identical DNA sequences (c) Be cut by the same restriction enzyme (d) Be of the same length

**8. Expression vector differ from cloning vector in having:**

(a) An origin of replication (b) Suitable marker genes (c) Unique restriction sites (d) Control elements

**9. What is the purpose of the technique of site-directed mutagenesis?**

(a) To alter the sequence of a DNA segment (b) To determine the sequence of a DNA segment (c) To alter the expression of a gene (d) To determine if a protein binds to a gene's promoter

**10. Which of the following statement is true?**

(a) A vector should have an origin of replication (b) A vector should have selectable marker (c) A vector should have unique restriction sites (d) All of the above

**11. Often, protein to be expressed is fused with histidine and it is called as histidine tags. For their purification, matrix containing \_\_\_\_\_ is used.**

(a) Calcium ions (b) Nickel ions (c) Iron ions (d) Fluorine ions

**12. The advantages of using *E. coli* as host for production of recombinant protein are:**

(a) Easy scale-up and simple media requirement (b) Can easily perform splicing of foreign DNA (c) Produces processed and properly modified protein (d) All of the above

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**Question two:**

**3 Marks**

**Complete the sentence with the most appropriate term(s).**

1. Restriction enzymes are also termed restriction \_\_\_\_\_.
2. Type II restriction enzymes typically recognize sequences which are \_\_\_\_\_ (i.e.: identical when read 5' to 3' on both strands).
3. DNA that is made from RNA is termed \_\_\_\_\_ DNA.
4. The enzyme \_\_\_\_\_ can make a DNA copy from an RNA strand.
5. The enzyme \_\_\_\_\_ can make phosphodiester bonds between two DNA bases.
6. A group of genes or a segment of DNA that functions as a single transcription unit. It is comprised of an operator, a promoter, and one or more structural genes that are transcribed into one polycistronic mRNA is termed \_\_\_\_\_.

**Question Three:**

**7 Marks**

**A. Select the correct definition for each term.**

- |                              |  |
|------------------------------|--|
| 1. _____ Plasmids            | a. A carrier for DNA in a cloning experiment.  |
| 2. _____ Restriction enzymes | b. Enzymes that recognize palindromic sequences in the DNA and cut them using endonuclease activity.                             |
| 3. _____ Selectable marker   | c. Small circular pieces of extranuclear DNA   |
| 4. _____ Vector              | d. cells that have been specially treated to transform efficiently.  |
| 5. _____ Competent cells     | e. Cells that harbor vectors.  |
| 6. _____ Transformation      | f. The process of introducing DNA into mammalian cells   |
| 7. _____ Host cells          | g. The process by which a plasmid vector is introduced into bacterial cells  |
| 8. _____ Transfection        | h. The use of a virus to carry the cloned DNA into a host cell.  |
| 9. _____ Viral vectors       | i. A gene contained within a vector that allows a researcher to choose bacterial colonies that contain only recombinant vectors. |

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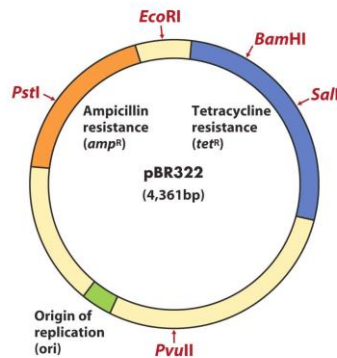
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B. Match each feature of the plasmid pBR322 (at left) with one appropriate description presented (at right) (see illustration of pBR322 below). Descriptions may be used more than once



- |                           |  |
|---------------------------|--|
| 1. _____ $amp^R$ sequence | a. permits selection of bacteria containing the plasmid                              |
| 2. _____ $ori$ sequence   | b. a sequence required for packaging recombinant plasmids into bacteriophage         |
| 3. _____ $tet^R$          | c. origin of replication   |
| 4. _____ $BamHI$ sequence | d. cleavage of the plasmid here does not affect antibiotic sequence resistance genes |
| 5. _____ $PstI$ sequence  | e. allow the insertion of foreign DNA.   |

Question Four:

8 Marks

1. What are the advantages and disadvantages of using *E. coli* as host for production of recombinant proteins?

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**2. Chromatography is an essential step in the purification of biotech products. Name at least five different chromatographic purification methods.**

**3. How does one sterilize biotech products for parenteral administration?**

**4. What are the options for inducing therapeutic actions upon attachment of immunoliposomes to (tumor) target cells?**

**End of Questions**  
*Good Luck*