

**Philadelphia University**

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**Student Name:**

**Student Number:**

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Mark: /20 /

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بالتوفيق

## **I- Chose the correct answer: (2 points each)**

1-The development of tissue culture as a useful tool in the modern laboratory arose largely because of the needs of the following:

- A- The production of antiviral vaccine.
- B- Cancer research
- C- A and B are corrects
- D- None of the above is corrects.

2-Which of the following is/are **not** considered as advantage of tissue culture:

- A- The remains homogeneity of cell types (Achieved through serial passage).
- B- It is economical because smaller quantities of reagents are needed compare to *in vitro*.
- C- Unstable aneuploid chromosome constitution.
- D- A and B are corrects
- E- A and C are corrects.

3- Which of the following is/are considered as **disadvantage** of tissue culture

- A. It needs controlled physiochemical environment (pH, Temperature, osmotic pressure. O<sub>2</sub>, CO<sub>2</sub>, etc.
- B. The legal, moral and ethical questions of animal experimentation can be avoided.
- C. Unstable aneuploid chromosome constitution.
- D. A and B are corrects
- E. A and C are corrects

4- Which of the following is/are considered as a role/ function of genes?

- A- To encode the nucleotide sequences of mRNA.
- B- To encode the nucleotide sequences of tRNA.
- C- To regulate the expression of other genes.
- D- All of the above are corrects.
- E- None of the above are corrects.

5- Which of the following is **not** correct for restriction enzymes type I

- A- After traveling 1000-5000 bp the enzyme cleaves only one strand of the DNA randomly
- B- Those enzymes create a gap of about 75 bp in length.
- C- This kind of Enzyme is useful for gene manipulation because their cleavage sites are not specific.
- D- A and B are corrects
- E- None of the above is corrects

- 6- Which of the following is correct/s for restriction enzymes type II?
- A. Enzyme belong to this group are used in gene manipulation.
  - B. Those enzymes recognize a particular target sequence in a double stranded DNA molecule.
  - C. Those enzymes do not require Mg<sup>2+</sup> ions for restriction (cutting).
  - D. A and B are corrects.
  - E. B and C are corrects.

7- **Yeast artificial chromosome are**

- A- Self-replicating elements
- B- Able to insert segments up to 400 kb.
- C- Can replicate any inserted DNA via transfer to yeast cells.
- D- D- A, B and C
- E- None of the above

8- **Which of the following is/are a function/s of TFIIF in transcription process:**

- A- Act as helicase which unwinds the DNA.
- B- Also act as kinase that adds phosphate groups to the C-terminal domain of the largest subunit of RNA polymerase II.
- C- recognizes the TATA components of the RNA polymerase II core promoter.
- D- A and B
- E- A, B and C

9- **Which of the following is correct for Poly A tail.**

- A- Virtually all eukaryotes have a series of up to 250 bp of adenosines at the 3' ends.
- B- These are not part of the template DNA.
- C- These sequence are added to the transcript by a template independent RNA polymerase called poly(A) polymerase.
- D- A and B
- E- A, B and C

10- **Cloning is a form of \_\_\_\_\_ reproduction.**

- A- Sexual
- B- Asexual
- C- A and B
- D- Neither A nor B

**II- Fill the brackets with true for the correct sentences and false for the incorrect ones. (2 points each)**

- ( ) 1- It was found that serum should be supplemented with 50-70% to provide completely adequate medium for the continuous propagation of established cell lines.
- ( ) 2- DNA ligase allows joining together any two DNA fragments.
- ( ) 3- Phage vector can insert up to 35 kb DNA fragments
- ( ) 4- Nucleotide which is used in sequencing reaction is known as deoxynucleotide
- ( ) 5- mRNA strand can form a double-stranded hybrid with a DNA strand.
- ( ) 6- The ideal buffer **should interfere** with chemical or biochemical process of the culture.

**III- Fill in the blank with the correct answer. (2 points each)**

- 1- What is Animal Biotechnology?

2- A nucleotide consists of \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

4-- Capping of RNA polymerase is an important step in \_\_\_\_\_ where an extra \_\_\_\_\_ is added to the extreme 5`-end of the RNA.

5- Large Ribosomal subunit is also called 60S subunit composed of \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

**V- Short answers questions. (Chose one question from A and B to answer)**

**A- Summarized RNA translation elongation process? (12 points)**

**B- As a biotechnologist your supervisor asks you to establish a cell line from liver tissue in point format explains the protocol you used. (12 points)**

**C- Explain how eukaryote cell control its RNA processing? (6 points)**

**D- Open tissue culture vessel are kept in humidified incubator is this statement correct or not? Explain why? (6 points)**

**E-The basic principle of particle bombardment for gene transfer the most gene transfer technique used in animal and human is this statement correct or not explain why?(6 points)**

**F-Cosmid is a natural vector is this statement correct or not? Explain how you can construct such vector? (6 points)**