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| **Philadelphia University**<br>**Lecturer: Dr. Mohammad Shomali**<br>**Subject: Pharmaceutical Biotechnology** | | **Faculty of Pharmacy** |

**Student Name in Arabic:** **Student Number:**

**Course: Pharmaceutical Biotechnology** **Second Semester/Academic Year 2015/2016**

**Course Number**: 0510541 **Date: 12/04/2016**

**First Exam** **Duration of Exam: 50 min**

**Information for Candidates**

*1. This examination paper contains 6 pages, 21.5 totaling marks.*

*2. The mark for short assay questions is shown in round brackets.*

*3.The mark for each MCQ is 0.6*

**Notes to Candidates**

*1. You should attempt to solve all questions.*

*2. You should write your answers clearly*

| Question | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | | | | | | | | | | | | | | | | | | | | |
| B | | | | | | | | | | | | | | | | | | | | |
| C | | | | | | | | | | | | | | | | | | | | |
| D | | | | | | | | | | | | | | | | | | | | |

| Question | 21 | 22 | 23 |
|---|---|---|---|
| A | | | |
| B | | | |
| C | | | |
| D | | | |

1) What is a biotechnological product?
   A) Penicillin
   B) Monoclonal antibodies
   C) Simvasten
   D) Cyclostatin

2) Microbial biotechnology use for:
   A) Production of non-glycosylated proteins
   B) Production of antibiotics
   C) Production of enzyme used for decontamination processes
   D) All of the above
3) Animal biotechnology does not used for
   A) Production of antibody
   B) Generating transgenic animals
   C) Production of food with high vitamin continent
   D) A and B
4) The principle of knocking out of gene is:
   A) Gene activation
   B) Gene inhibition or removing
   C) Gene crossing over
   D) B and C

5) Medical biotechnology does not involve in:
   A) Treatment of human disease
   B) Gene therapy
   C) Preventive medicine
   D) DNA fingerprinting

6) Regenerative medicine includes these steps, except:
   A) Isolation of embryonic stem cells
   B) Culturing stem cell under certain condition to stay in a undifferentiating state
   C) Manipulate stem cells by gene therapy approaches
   D) Reinsert these cells in the patients

7) Golgi apparatus does not functions as:
   A) Protein synthesis center
   B) Lipid synthesis center
   C) Protein packaging center
   D) A and B

8) Karyotyping means:
   A) Studying of the chromosome number and structure
   B) Studying of DNA
   C) Studying of RNA
   D) Studying of protein

9) Semiconservative Replication means:
   A) Both DNA strands are new
   B) Only one strand of the DNA is new
   C) Bothe are original
   D) Making RNA

10) DNA replication, transcription and RNA translation should go in this direction:
   A) From 5’ to 3’
   B) From 3’ to 5’
   C) From 5’ to 5’
   D) From 3’ to 3’

11) Diphosphoester bond are formed between Okazaki fragments by
   A) DNA polymerase
   B) RNA polymerase
   C) Helicase
   D) Ligase

12) The difference between DNA and RNA polymerase is:
    A) DNA polymerase needs primer
    B) RNA polymerase need primer
    C) DNA polymerase needs promotor
    D) RNA polymerase needs origin of replication

13) What is not true about transcription
    A) RNA polymerase binds to the promotor
    B) Only one copy of mRNA is produced
    C) Only one strand of DNA will be copied
    D) NTP are used as substrate for the enzyme

14) Posttranscriptional modification includes all, except
    A) Capping of mRNA at 5'
    B) Poly A tailing at 3'
    C) Repairing of RNA
    D) Splicing of the mRNA

15) What is true about genetic codes:
    A) It is not universal, each organism has its own genetic code
    B) Consist of different number of nucleotides
    C) Read from 5' to 3' and from 3' to 5'
    D) We have 64 different genetic codes

16) Levels of gene expression regulation include all, except:
    A) Gene methylation
    B) Histone acetylation
    C) DNA degradation
    D) Protein degradation

17) Restriction enzyme are:
    A) Enzyme that hydrolysis the DNA
    B) Enzymes that cut the DNA specifically
    C) Enzyme that cleave amide bond
    D) Enzyme that cut carbohydrates

18) Selection after transformation of bacteria means:
    A) Isolation of the bacteria that hold the gene of interest
    B) Isolation of all the bacteria
    C) Killing the bacteria
    D) Culturing of the bacteria in normal medium

19) Plasmids must have these features to be used as a vector, except
   A) Multiple cloning site
   B) Selectable marker genes
   C) Origin of replication
   D) SiRNA

20) cDNA libraries mean:
   A) Total mRNA of the organism is collected, rewrote as cDNA, fragmented and saved in the bacteria as a host
   B) The genomic of the organism are collected, fragmented and saved in the bacteria as host
   C) cDNA of the organism are collected, fragmented and saved in the bacteria as host
   D) None of the above

21) Which electrostatically bonds do form secondary structure in proteins?
   A) Hydrogen bonding between side chain
   B) Hydrogen bonding between amide oxygen and amide protein
   C) Covalent bonds between S-S
   D) All of the above

22) Denaturation of protein means:
   A) The native structure of protein changes
   B) Protein degradation
   C) Protein inactivation
   D) Protein solubilization

23) Protein upstream process means:
   A) Production of the protein as inclusion bodies
   B) Production of the protein, soluble, in culturing media
   C) Production of the protein chemically in the lab
   D) A and B

Assay questions:

1) Please define each: 2

   A) Recombinant DNA:

   B) Northern blotting:

   C) Proteomics:

   D) Pharmacogenomics:

2) Please list 3 methods used to identify the gene of interest: 1.5
   1)
   2)
   3)

3) Why we do gene mutagenesis studies? 0.5

4) Explain: SiRNA can be used in treatment of different dieses. 1

5) Explain: Proteome is much more diverse in spit we have only limited number of genes: 0.5

6) Explain: One uses high temperature during annealing step in PCR: 0.5

7) Please write the principle of DNA-Microarry technology: 1

8) Explain: The best host for protein production is the mammalian cells: 0.5