KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2023

Marks Scored:

Level : B.Pharm.
Year : IV
Course : PHAR 422
Semester : II
Exam Roll No. :
Time: 30 mins.
F. M. : 20
Registration No.:
Date May-09, 023

SECTION "A"
[20Q. × 1 = 20 marks]

Encircle the most appropriate alternative from each set of choices.

1. Which of the following process is an example of green biotechnology?
   a. Designing an organism to produce therapeutic proteins.
   b. Designing an organism to produce useful chemical, food and enzyme.
   c. Designing a process to increase seafood supply and safety.
   d. Designing transgenic plants to produce high yield and quality.

2. Which of the following is not the product of new biotechnology?
   a. ethanol b. golden rice c. humulin d. flavr savr tomato

3. What is apoenzyme?
   a. It is a complete biologically active enzyme.
   b. It is an inactive protein portion of an enzyme.
   c. It is a non-protein group.
   d. It is a prosthetic group.

4. The enzyme glucokinase exhibit.....
   a. absolute specificity b. group specificity
   c. stereochemical specificity d. linkage specificity

5. Which of the following statement about enzyme immobilization is false?
   a. Use of immobilized enzyme will decrease the product contamination and easy product separation.
   b. Immobilized enzyme can be used for both soluble and insoluble substrates.
   c. Immobilized enzyme can be used for continuous production system.
   d. Immobilized enzyme can be used for non-aqueous system.

6. Which of the covalent linkage between enzyme and carrier is reversible?
   a. carbamate bond b. diazo linkage
   c. disulphide linkage d. isourea linkage

7. Biochemical oxygen demand is .....
   a. amount of atmospheric oxygen dissolved in waste water
   b. amount of dissolved oxygen used in decomposition of organic and inorganic matter in waste water
   c. amount of dissolved oxygen used by anaerobic microorganism when decomposing organic matter in waste water
   d. amount of dissolved oxygen used by aerobic microorganism when decomposing organic matter in waste water

8. While constructing the fermenter, which of the following is not required?
   a. high speed agitation and aeration system
   b. temperature control system
   c. pH control system
   d. sampling facilities

9. DNA ligase join the two DNA fragments by.....
   a. forming the phosphodiester bond between free OH group at 3' end of one DNA chain and phosphate group at 5'end of another DNA
   b. forming the phosphodiester bond between free OH group at 5' end of one DNA chain and phosphate group at 3'end of another DNA
   c. forming the phosphodiester bond between free phosphate group at 5' end of one DNA chain and phosphate group at 3'end of another DNA
   d. forming the phosphodiester bond between free OH group at 5' end of one DNA chain and OH group at 3'end of another DNA

10. Synthesis of RNA transcript occurs in ..... direction as the DNA template is read in ..... direction.
   a. 3' to 5' ; 3' to 5'
   b. 3' to 5' ; 5' to 3'
   c. 5' to 3' ; 5' to 3'
   d. 5' to 3' ; 3' to 5'

11. All of the following processes results in physical instability of the protein except .....
   a. disulphide bond rearrangement within the polypeptide chain
   b. aggregation of protein molecules to form dimer or larger oligomer
   c. formation of visible precipitates of protein particles in the solution
   d. adsorption of protein to the surface of the immediate container closure system

12. Which of the following amino acid is polar but uncharged?
   a. glycine
   b. arginine
   c. serine
   d. phenylalanine

13. Which of the following vector can accommodate maximum DNA insert for cloning?
   a. Plasmid
   b. Bacterial artificial chromosome
   c. Cosmid
   d. Mammalian artificial chromosome

14. The ability of host cell to uptake rDNA is induced chemically by means of treating the cells with.....
   a. ethanol
   b. PEG
   c. calcium chloride
   d. ethidium bromide

15. .....mAb is constructed with complementarity determining region derived from mouse and remaining of variable and constant region derived from human source.
   a. Murine
   b. Chimeric
   c. Humanized
   d. Human

16. For in-vivo production of murine monoclonal antibodies, hybrid cells are propagated in ..... cavity of mice.
   a. peritoneal
   b. thoracic
   c. cranial
   d. pelvic

17. A vaccine containing peptide sequence corresponding to epitope fused with carrier protein is classified as.....
   a. recombinant protein vaccine
   b. recombinant peptide vaccine
   c. nucleic acid vaccine
   d. peptide vaccine

18. Which of the following statement is false regarding the biological precaution to be taken in biotechnology lab?
    a. The organism should be disposed in biohazard bag and autoclaved at 15 psi for 30 min at 121 °C.
    b. Storage of organism requires that the new culture of bacteria to be propagated at least once a month to maintain adequate live cells.
    c. DNA should be kept frozen in specially designed frost-free freezer.
    d. Bench work areas should be decontaminated using 10 % bleach solution at least once per day.

19. In most countries, how long does copyright last for?
    a. 10 years after creation of work
    b. 50 years after creation of work
    c. 10 years after death of creator
    d. 50 years after death of creator

20. A pathogen that can cause serious human or animal disease but does not ordinary spread from one infected individual to another and effective treatment and preventive measures are available. Such organisms are categorized into .....
    a. Risk group 1
    b. Risk group 2
    c. Risk group 3
    d. Risk group 4

KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2023

May - 09, 023

Level : B.Pharm.
Year : IV
Time : 2 hrs. 30 mins.

Course : PHAR 422
Semester: II
F.M. : 55

SECTION "B"
[5Q. × 3 = 15 marks]

Attempt *ANY FIVE* questions.

1. Differentiate between competitive and non-competitive enzyme inhibition.

2. How do you sterilize the fermentation media, supply air and fermenter?

3. What is enzyme immobilization? List down the various ways by which immobilization improves the enzyme property.

4. Describe briefly about the types and cleavage pattern of restriction endonuclease enzyme.

5. What is glycosylation? Mention the functional effects of glycosylation on protein.

6. Describe the structure of DNA and RNA.

7. Write about the body's immunological response after active immunization by vaccine.

SECTION "C"
[5Q. × 5 = 25 marks]

Attempt *ANY FIVE* questions.

8. Define old and new biotechnology with appropriate examples. What are the differences between biopharmaceutical and small molecule medicine?

9. Describe about the factors affecting enzyme activity.

10. Write short notes on the following:
    a. Cell bank system
    b. Solid liquid separation

11. What do you understand by biosafety level? Give containment requirement for biosafety level 1, 2, 3 and 4.

12. Classify modern vaccines. Explain any two types of the modern vaccines.

13. Differentiate between monoclonal and polyclonal antibodies. How desired hybridoma cells are selected using HAT medium for producing murine monoclonal antibodies?

14. Give brief account on patent and plant breeder's right.

SECTION "D"

[2Q. × 7.5 = 15 marks]

Attempt *ANY TWO* questions.

15. Explain in detail about the various methods by which the enzyme or whole cells can be immobilized.

16. What are the forces that stabilize the protein native conformation? Write about the formulation approaches to protein stabilization.

17. What is recombinant DNA (rDNA)? Write about the methods to propagate rDNA into the host cell. How the host cells containing rDNA are selected?