

KATHMANDU UNIVERSITY
End Semester Examination
March/April, 2022

Mark scored:

Level : B. Pharm.

Year : IV

Exam Roll No. :

Time: 30 mins.

Course : PHAR 422

Semester : II

F. M. : 20

Date :

Registration No.:

SECTION "A"
[20Q × 1 = 20 marks]

Encircle the most appropriate option.

- Golden rice is
 - a variety of rice grown along the yellow river in China.
 - long stored rice having yellow color tint.
 - a transgenic rice having gene for carotene.
 - wild variety of rice with yellow colored grain.
- Which of the following statement is false regarding new biotechnology?
 - New biotechnology was developed after the discovery of DNA structure.
 - It uses the organism's inherent capabilities for making useful products.
 - It generates the valuable products by improving the natural capabilities of microorganism.
 - Bt cotton, golden rice, humulin are some of the examples of new biotechnology products.
- Which of the following is the non-protein biocatalyst?
 - Extremozyme
 - Abzymes
 - Ribozymes
 - Isozymes
- All of the following statements regarding V_{max} and K_m are true except
 - V_{max} is the maximum rate at which a particular enzyme catalyzed reaction can proceed.
 - K_m is the concentration of substrate at which the rate of reaction reaches V_{max} .
 - A low K_m value specifies high affinity of an enzyme toward its substrate.
 - A large K_m value indicates low affinity of an enzyme toward its substrate.
- Which of the following covalent linkage between enzyme and carrier is reversible?
 - Disulphide bond
 - Isourea linkage
 - Diazo linkage
 - Carbamate bond
- All of the following are the properties of ideal carrier for enzyme immobilization except
 - Should have high rigidity and physical strength.
 - Should be soluble in operational media.
 - Should have high permeability and regenerability.
 - Should have large surface area.
- In fermentation, upstream processing begins with
 - isolation, selection and improvement of suitable strain of microorganism.
 - removal of single ampoule of working cell bank from storage and its use to prepare starter culture.
 - recovery and purification of desired end products.
 - effluent treatment.
- Which of the following is not a criterion for choice of recovery process in fermentation?
 - Location of the product
 - Price of the product
 - Use of the product
 - Source of organism
- What is nucleotide?
 - A nucleotide is a heterocyclic base.
 - A nucleotide is a sugar molecule covalently bonded to a heterocyclic base.
 - A nucleotide is a sugar molecule bonded to phosphate group and a heterocyclic base.
 - A nucleotide is a heterocyclic base bonded to phosphate group.

10. What is the role of topoisomerase in eukaryotic DNA replication?
 - a. Topoisomerase enzyme cut, uncoil and reseal the double stranded DNA.
 - b. Topoisomerase bind to the origin of replication site within the double stranded DNA.
 - c. Topoisomerase open up the double stranded DNA at the replication fork.
 - d. Topoisomerase join the okazaki fragments together with phosphodiester bonds.
11. Which of the following restriction endonuclease produce blunt end?
 - a. HindIII
 - b. SmaI
 - c. EcoRI
 - d. BamHI
12. Which of the following vector is able to propagate in two different host species?
 - a. Plasmid
 - b. Yeast artificial chromosomes
 - c. Shuttle
 - d. Cosmid
13. A linear polymer of more than 50 amino acid residues is referred to as
 - a. dipeptide
 - b. oligopeptide
 - c. peptide
 - d. polypeptide
14. Native structure of protein is stabilized by
 - a. hydrophobic effect in which non polar amino acid residue is buried in the interior of polypeptide chain.
 - b. covalent linkage between the side chain group of amino acids other than disulphide linkage.
 - c. only intramolecular hydrogen bonds contribute significantly to the conformational stability.
 - d. none of the above
15. In monoclonal antibodies production, the hybridomas are made by
 - a. fusing T cells with myeloma cells.
 - b. fusing B cells with myeloma cells.
 - c. fusing T helper cells with myeloma cells.
 - d. fusing B memory cells with myeloma cells.
16. HGPRT deficient myeloma cells are selected by treating the cells with
 - a. 8 azaguanine
 - b. aminopterin
 - c. hypoxanthine
 - d. thymidine
17. Plasmid encoding antigenic protein from a pathogen is directly injected into the cells where it expresses constitutes
 - a. recombinant vaccine
 - b. live vector vaccine
 - c. nucleic acid vaccine
 - d. peptide vaccine
18. What protects the intellectual property created by an artist?
 - a. Copyright
 - b. Geographical location
 - c. Patent
 - d. Trademark
19. What is the function of biosafety cabinet?
 - a. A primary barrier to reduce the spreading of disease caused by microorganism into laboratory environment.
 - b. A work space to culture and sub-culture the bacteria.
 - c. A designated space to prevent cross-contamination due to air borne contaminant during transfer of bacteria.
 - d. Provide extra ventilation to ensure enough sterilization when sub-culturing or transferring bacteria.
20. Which of the following organism is not to be worked in biosafety level 1?
 - a. Bacillus subtilis
 - b. E. coli K12
 - c. Salmonella species
 - d. Adeno-associated virus

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Note: Check (✓) the number of each question you have answered in the front page of main answer book (of Sections B, C and D).

SECTION "B"
[5Q × 3 = 15 marks]

Answer ANY FIVE questions.

1. Write about the contribution of biotechnology in pharmaceutical field.
2. What is enzyme immobilization? Mention its advantages and disadvantages.
3. Define batch process, fed batch process and continuous process of fermentation.
4. Mention the objectives of recombinant DNA technology.
5. What do you mean by primary and secondary structure of protein?
6. Differentiate between DNA and RNA molecule.
7. Write about second generation monoclonal antibodies.

SECTION "C"
[5Q × 5 = 25]

Answer ANY FIVE questions.

8. How the enzyme activity is regulated inside the body?
9. Describe about the irreversible methods of enzyme immobilization.
10. How do you ensure the introduction of rDNA in host cell? Explain with suitable examples.
11. What are the biotechnological precautions to be taken to ensure safety in biotechnology?
12. What is intellectual property right? Explain any two ways by which intellectual property can be protected.
13. Discuss about the design and construction of fermentor with suitable diagram.
14. Write about the formulation approach for protein drug delivery.

SECTION "D"
[2Q × 7.5 = 15]

Answer ANY TWO questions.

15. What is the mechanism of enzyme catalytic action? Write about the factors affecting enzyme activity.
16. Describe in detail about the production of murine monoclonal antibodies.
17. Explain about various modern subunit vaccines. Write about the formulation of vaccine delivery system.

