

**B.Sc. BIOTECHNOLOGY  
FIRST SEMESTER (REPEAT)  
BIOTECHNOLOGY & HUMAN WELFARE  
BBT-103  
[USE OMR FOR OBJECTIVE PART]**

**SET  
A**

Duration: 3 hrs.

Full Marks: 70

**( Objective )**

Time: 30 mins.

Marks: 20

**Choose the correct answer from the following:**

**1 × 20 = 20**

- Random mutagenesis helps in:
  - Creating a variety of mutants
  - Directed evolution
  - Protein evolution
  - All of the above
- Hepatitis vaccine, a .....vaccine, is produced by cloning .....gene in yeast cells.
  - Recombinant; HbS
  - Subunit; HbS
  - Subunit; HbSAg
  - Attenuated, HbSAg
- Which of this is an HCB?
  - Escherichia coli*
  - Clostridium botulini*
  - Alcanivorax borkumensis*
  - Listeria monocytogens*
- Rhizosphere effect is:
  - Enhancement of the growth of a soil microorganism
  - Increase in plant root growth in soil
  - Increase in fungal growth in soil
  - None
- Which of these is solved by DNA fingerprinting?
  - Crime bases
  - Paternity disputes
  - Immigration issues
  - All
- Diabetes can be cured by gene therapy.
  - True
  - False
  - Maybe
  - Can't say
- Which chromosome has the least no. of genes?
  - Chromosome X
  - Chromosome I
  - Chromosome Y
  - Chromosome 11
- Antibiotic penicillin is produced by:
  - Aerobic method
  - Anaerobic method
  - Bacteria
  - Algae
- Arbuscular fungi are also known as:
  - Ectomycorrhiza
  - Endomycorrhiza
  - Hartig net
  - Epiphytes
- PHB is a thermoplastic polymer.
  - True
  - False
  - Maybe
  - Can't say

11. Which of these pollutants cannot be treated by bioremediation and can harm food chain?
  - a. Mercury
  - b. Carbon
  - c. Zinc
  - d. Nitrogen
12. Which vectors are used for large scale genome projects?
  - a. Phage vectors
  - b. BAC
  - c. YAC
  - d. Both b and c
13. Hybridoma cell follow which pathway for selection?
  - a. De novo pathway
  - b. Salvage pathway
  - c. Both a and b
  - d. None
14. Biolistics is also known as:
  - a. Microparticle carrier
  - b. Gene gun
  - c. Particle bombardment
  - d. All of the above
15. Addition of gasoline to fuel:
  - a. Increases the fuel's cost
  - b. Increases the fuel's harmful emissions
  - c. Increases the fuel's octane rating
  - d. None
16. 1<sup>st</sup> gene therapy was done to.....
  - a. Correct ADA gene
  - b. Cure cystic fibrosis
  - c. Modify adenosine deaminase enzyme
  - d. Both a and c
17. Which of these serves as a sample for DNA fingerprinting?
  - a. Blood
  - b. Saliva
  - c. Hair follicle
  - d. All of the above
18. Hartig net is formed by:
  - a. Ectomycorrhiza
  - b. Endomycorrhiza
  - c. Plants
  - d. Bacteria
19. Proteases are widely used in:
  - a. Textile industry
  - b. Detergent industry
  - c. Food packaging industry
  - d. Cosmetic industry
20. Which enzyme is involved in PHB biosynthesis?
  - a. NADPH dependent acetoacetyl-CoA reductase
  - b.  $\beta$ -ketoacyl-CoA amylase
  - c. P(3HB) depolymerase
  - d. All of the above

( Descriptive )

Time : 2 hr. 30 mins.

Marks : 50

[ Answer question no.1 & any four (4) from the rest ]

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|---|-----------|
| 1. Define vaccine. Mention the important categories of vaccine. Add a brief note on how vaccines help in developing resistance against pathogens. | 2+4+4=10  |
| 2. Define the technique of PCR. Discuss briefly the principle of PCR mentioning the component requirement for PCR reaction.                       | 2+8=10    |
| 3. Give five important properties of ethanol. Describe the process of ethanol production in industry with suitable diagrams and reactions.        | 2+8=10    |
| 4. a) Describe the process of production of insect resistant transgenic plant (BT plant).   | 4         |
| b) How does plant-microbe interaction help in nitrogen fixation? Describe in detail.  | 6         |
| 5. a) What is chlorination? Why do we chlorinate water? Briefly explain chlorine demand with diagram.   | 1+1+3+1=6 |
| b) What is biodegradation and bioremediation?   | 2+2=4     |
| 6. Discuss briefly the steps involved in <i>Agrobacterium tumefaciens</i> mediated gene transfer technique.                                       | 10        |
| 7. a) What is medicinal chemistry? What does it involve?  | 1+2=3     |
| b) What is bioisosterism? What are its effects? Explain the discovery of Librium drug.  | 1+1+5=7   |
| 8. Write short notes on:  | 5+5=10    |
| a) DNA fingerprinting   |           |
| b) Human genome project   |           |

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