Enrollment No._____

**NAVRACHANA UNIVERSITY**
a UGC recognized University

**School:** School of Science
**Program/s:** B.Sc. Microbiology
**Year:** 2nd **Semester:** 3rd
**Examination:** End Semester Examination
**Examination year:** December 2022

**Course Code:** LS276 **Course Name:** **Microbiology-I**
**Date:** 06/12/2022 **Total Marks:** 40
**Time:** 11:30 am to 01:30 pm **Total Pages:** 3

***Instructions:***

- *Write each answer on a new page.*
- *Use of a calculator is permitted/not permitted.*
- ** COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping*

| Q. No. | Details | Marks | COs* | BTL# |
|---|---|---|---|---|
| Q.1 | **Do as directed** | **10** | | |
| | 1. The five-kingdom system is no longer accepted by most biologists because:<br>a) Its lack of distinction between Archaea and Bacteria.<br>b) The kingdom Protista is too diverse to be taxonomically useful.<br>c) The boundaries between the kingdoms Protista, Plantae & Fungi are ill-defined.<br>d) All of the above<br>2. Which of the following is **NOT** true about methanogens?<br>a) They are strict anaerobes<br>b) They obtain energy by converting $CO_2$, $H_2$, formate, methanol, acetate and other compounds to either methane or methane and $CO_2$.<br>c) They are strict aerobes<br>d) All of the above<br>3. The biocidal action of $NO_2$ is due to:<br>a) breaking of bacterial cell wall<br>b) degradation of DNA<br>c) both (a) and (b)<br>d) None of the above<br>4. The tobacco mosaic virus is an example of _____ capsid structure:<br>a) Complex<br>b) Icosahedral<br>c) Helical<br>d) None of the above<br>5. Tinea capitis is a _____ infection.<br>a) bacterial<br>b) viral<br>c) Protozoan<br>d) None of the above<br>6. If the dilution ratio of phenol is 100 and dilution ratio of a disinfectant is 700 calculate the phenol coefficient for the disinfectant. | | CO1<br>CO2<br>CO3<br>CO4<br>CO5 | BT1<br>BT2<br>BT3<br>BT4 |

7. A researcher got the following results while classifying strains A and B based on numerical taxonomy: Number of same characters:5. Number of different characters: 5. Calculate the % Similarity of A and B.
8. What is meant by anoxic environment?
9. Define Tyndallization.
10. For sterilization which would you prefer, dry and moist heat? Give reason

**Q.2** **Answer in brief (Any 7)** **14**

1. Who gave the eight-kingdom classification system? State one salient feature of the system.
2. Which is the extreme habitat that halobacterium can survive in? State at least one reason why they cannot survive in any other habitat?
3. Can methanogenesis also be an ecological problem? (Answer with reason)
4. Match A (Organism) with B (Characteristics):

| A-Organism | B-Characteristics |
|---|---|
| 1. Photolithotrophs | a. Use compounds like sugar and amino acids as electron donors and chemical compounds as source of energy |
| 2. Chemolithotrophs | b. Use light as source of energy and inorganic compounds as electron donors |
| 3. Chemoorganotrophs | c. Use light as source of energy and compounds such as fatty acids and alcohol as electron donor |
| 4. Photoorganotrophs | d. Use inorganic compounds as source of electron and chemical compounds as source of energy |

5. Who discovered Penicillin. What was the significance of this discovery?
6. State difference between (a) Auxochormes and Chromophores (b) Acidic & basic stains
7. Pasteur took a swan-neck flask containing heated meat broth and kept in open air. No growth of microbes occurred. Why no growth was seen in spite of the flask being kept in open air?
8. The icosahedral capsid is the most efficient way to enclose a space. Why?

CO1 CO2 CO3 CO4 — BT1 BT2 BT4

**Q.3** **Write short notes on (Any 2)** **6**

1. The principle and method of gram-staining (Also, give reason why the stain works best with young cells).
2. Any one physical method of sterilization emphasizing on the principle, method in brief and advantages over other methods.
3. Scope of Microbiology.

CO1 CO2 CO3 CO5 — BT1 BT2 BT4

**Q.4** **Answer in detail (Any 2):** **10**

1. Write in brief about the reproduction and importance of cyanobacteria.
2. State the principle and briefly explain the procedure for endospore staining using Schaefer-Fulton Method. According to you what is the importance of 'washing with water' and 'steaming' in the procedure?
3. State Koch's postulates explaining in detail how the experiments by Koch were helpful in proving the relationship between a microorganism and a specific disease.

CO1 CO2 CO3 CO4 — BT1 BT2 BT4

**********End of Question Paper**********