

Name :

Roll No. :

Invigilator's Signature :

CS/B.Sc.(H), GENET/BT/MOL.BIO/MICRO.BIO/SEM-2/POM-203/2012

2012

PRINCIPLES OF MICROBIOLOGY

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Multiple Choice Type Questions)

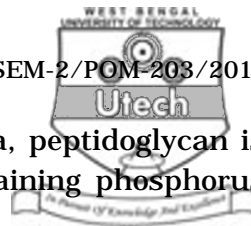
1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

- i) The primary stain used in acid-fast staining is
 - a) crystal violet
 - b) methylene blue
 - c) carbol fuchsin
 - d) safranin.
- ii) Moist heat kills all of the following *except*
 - a) *Brucella abortus*
 - b) *Mycobacterium tuberculosis*
 - c) *Salmonella typhi*
 - d) *Coxiella burnetii*.
- iii) Causative agent of food poisoning is
 - a) *Clostridium perfringens*
 - b) *Clostridium tetani*
 - c) *Clostridium botulinum*
 - d) none of these.



- iv) Which of the following is not true for lysogenic bacteria ?
- a) Remain integrated with bacterial genome
 - b) Replicate with the host
 - c) Bring about host lysis
 - d) A virulent phage.
- v) The micro-organism which uses light energy and carbon dioxide as their carbon source is
- a) Photo-lithotrophs b) Photo-organotrophs
 - c) Chemo-lithotrophs d) Chemo-organotrophs.
- vi) Which of the following is bactericidal ?
- a) Membrane filtration b) Ionizing radiation
 - c) Deep freezing d) All of these.
- vii) Archaea and bacteria are placed in separate domains because
- a) bacteria lacks cell membrane
 - b) bacterial cell wall contains amino acids
 - c) archaea have peptidoglycan
 - d) their rRNA sequences are different.
- viii) HEPA filters are
- a) high efficiency particulate air
 - b) high efficiency particular air
 - c) high efficacy particulate air
 - d) high efficient particulate air.
- ix) The unit of capsids is called
- a) capsomere b) capsule
 - c) nucleoid d) none of these.



- x) In most of the Gram-positive bacteria, peptidoglycan is associated with acidic polymers containing phosphorus called
- a) acetic acid b) techoic acid
c) glutamic acid d) nitric acid.
- xi) The genome of a tobacco mosaic virus is a
- a) monopartite b) dipartite
c) polypartite d) none of these.
- xii) The acid present in the endospore of the bacteria is known as
- a) picric acid b) muramic acid
c) dipicolinic acid d) diphenyl acid.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. Differentiate chromophore from auxochrome. Classify stain according to its charge with proper examples. Why is counter stain necessary for differential staining ? 1 + 2 + 2
3. Define biogenesis and abiogenesis. Discuss some experiments which favour biogenesis. 2 + 3
4. How do sterilization and disinfection differ ? What is pasteurization ? Describe the process of fractional sterilization or tyndalization ? 2 + 1 + 2
5. How do photoautotrophs and photoheterotrophs differ ? Give examples. 3 + 2
6. a) Give the postulates of "Germ Theory of Diseases".
b) State few characteristics of viruses. 2 + 3



GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. Classify bacteria according to their oxygen requirement. Describe numerical taxonomy in brief. Define simple matching coefficient (S_{SM}) and Jaccard coefficient (S_J). What is a dendrogram and how can dendrogram be interpreted? $4 + 2 + 2 + 3 + 4$
8. Classify virus according to its physical and chemical structures. Discuss in brief the structures of Tobacco Mosaic Virus. What is a bacteriophage? Differentiate lytic from lysogenic cycle. $5 + 4 + 1 + 5$
9. What are the differences between depth filter and membrane filter? Give the advantages and disadvantages of UV and ionizing radiation as sterilizing agent. Write the Koch's postulate. What are the contributions of Joseph Lister? $3 + 3 + 4 + 5$
10. What are the adaptations that help halophilic micro-organisms to thrive in extreme salinity? What is eclipse phase and latent phase in virology? Describe with graphs. What are the stages of viral growth cycle? Give diagrams. What do you mean by systematics of bacteria? $3 + 4 + 4 + 4$
11. a) Write down the principle behind Ziehl-Neelsen staining.
b) Why is *Mycobacterium tuberculosis* called acid fast bacteria?
c) Describe the contribution of scientists for the theory of abiogenesis.
d) What is pasteurization? $5 + 2 + 5 + 3$