

Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Sc.(H)/BT/Gen/Micro-Bio/Mol-Bio/SEM-2/POM-203/2013**

**2013**

**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) Which of the following is true ?
  - a) Eukaryotes have peptidoglycan cell walls
  - b) Cyanobacteria have prokaryotic cellular organisation
  - c) Paul Berg discovered prions
  - d) Robert Koch cultured polio virus.



ii) Use of agar as a solidifying agent for microbiological media was suggested by

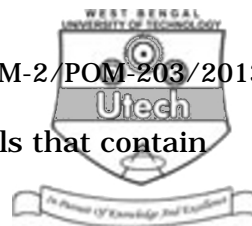
- a) R. Koch
- b) R. J. Petri
- c) F. Hesse
- d) D. H. Bergy.

iii) Which of the following is most likely to be bactericidal ?

- a) Autoclaving
- b) Membrane filtration
- c) Freeze - drying
- d) Deep - freezing.

iv) Pathogenic microorganisms are usually

- a) mesophilic
- b) thermophilic
- c) psychrophilic
- d) halophilic.



- v) Microwave oven will only heat materials that contain
- a) proteins
  - b) water
  - c) metals
  - d) lipid.
- vi) Influenza virus typically causes
- a) acute infection
  - b) chronic infection
  - c) latent infection
  - d) no infection.
- vii) The order of reagents used in gram-staining are
- a) crystal violet, iodine, alcohol, safranin
  - b) crystal violet, iodine, safranin, alcohol
  - c) crystal violet, safranin, iodine, alcohol
  - d) crystal violet alcohol, iodine, safranin.
- viii) The methanogenic archaea are
- a) microaerophilic
  - b) aerobic
  - c) strictly anaerobic
  - d) none of these.



- ix) The oldest recognised disinfectant is
- a) formaldehyde
  - b) chlorine
  - c) ethanol
  - d) phenol.
- x) Technique required to grow bacteria on solid media were developed by
- a) Pasteur
  - b) Koch
  - c) Leeuwenhoek
  - d) Ivanowsky.
- xi) Which of the following is true ?
- a) Strep throat and scarlet fever are caused by the same organism
  - b) Whooping cough is also called pertussis
  - c) Botulism causes diplopia
  - d) All of these.
- xii) Gastric ulcers are caused by
- a) spicy food
  - b) acidic food
  - c) *Helicobacter pylori*
  - d) stress.



**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

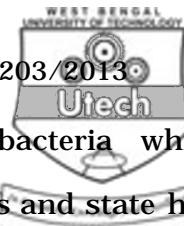
2. What was the contribution of Robert Koch ? State the postulates of "Germ theory of Diseases".
3. Write a short note on numerical taxonomy.
4. Describe any three types of deep mycoses.
5. Describe the principle and working of an autoclave.
6. Define auxochrome. Classify the staining techniques.

**GROUP - C**

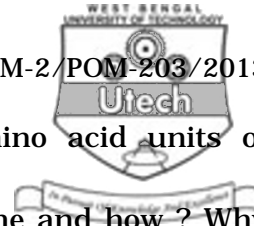
**( Long Answer Type Questions )**

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

7. What is the contribution of Robert Koch in the field of microbiology ? Write down the features of Koch postulate. Does every disease causing microbes follow Koch postulate ? What are the contribution of Joseph Lister, Edward Jenner and Alexander Fleming in the field of microbiology ? What is Tyndallization ?  $2 + 4 + 2 + 6 + 1$



8. Mention the adaptation of thermophilic bacteria which favours DNA stability. Name two methanogens and state how they synthesize methane. What are facultative and obligate anaerobes ? Give one example each. Classify bacteria according to the nutritional types. 3 + 5 + 3 + 4
9. How does salting and sugaring prevent foods from microbial invasions ? What is oligodynamic action ? Discuss the differences in the action of ionizing and non-ionizing radiation as sterilant. Name one organism that may be linked with canned food poisoning. 5 + 4 + 5 + 1
10. Discuss on taxonomy. What are the features of each kingdom in five kingdom classification ? Who proposed two kingdom and five kingdom classification ? 3 + 10 + 2
11. a) Suppose that you carry out a serial dilution of a 0.1 ml sample. The  $10^{-4}$  plate gives 90 colonies and the  $10^{-5}$  plate yields 5 colonies. Calculate the concentration ( bacteria/ml ) of the original, undiluted sample.
- b) Describe the nutritional requirements of the four major nutritional groups and give some microbial examples of each.
- c) Name the bacteria classified according to oxygen requirement. 3 + 6 + 6



12. What is tincture of iodine ? Which amino acid units of proteins and enzymes are effected by iodine and how ? Why cationic detergents are more effective than anionic ? What are the effects of HOCl against microbes ? How could be enzymes inactivated by  $\text{HgCl}_2$  ?

3 + 3 + 3 + 3 + 3

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