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**SARDAR PATEL UNIVERSITY**  
**M. Sc (Int.) Biotechnology: Semester II Examination**  
**Monday, 4th April, 2016**  
**Time: 10.30 am to 1.30 pm**  
**Sub: PS02CIGB04: Microbiology-I**

**Total Marks: 70**

**Q-1 Give the answer by choosing appropriate option. [8 X 1]**

- (1) Following is a decolorizer used in Gram's staining.  
 (a) Iodine (b) Alcohol (c) Saffranine (d) Any of these
- (2) Following is present in some Gram positive bacteria to protect against thermal injury and for stabilization of cell membrane.  
 (a) Techoic acid (b) Pseudomurein (c) Both of these (d) None of these
- (3) Following was the first person to recognize the significance of bacteria as a causative agent of disease.  
 (a) Kircher (b) Robert Hooke (c) Leeuwenhoek (d) Roger Bacon
- (4) \_\_\_\_\_ developed aseptic culture technique and isolated bacteria in pure culture.  
 (a) John Needham (b) Joseph Lister (c) John Tyndall (d) None of these
- (5) The transition of the resting spore to an actively dividing vegetative bacterial cell is \_\_\_\_\_.  
 a) Germination b) Capsulation c) Sporulation d) None of these
- (6) \_\_\_\_\_ is a problem with Electron microscopy.  
 (a) Staining (b) Resolution (c) Artifact (d) All of these
- (7) The refractive index of cedar wood oil is \_\_\_\_\_.  
 (a) 1.51 (b) 1.0 (c) 1.33 (d) 1.47
- (8) Following isolation method is not suitable for psychrophilic media.  
 (a) Streak plate (b) Pour plate (c) Spread plate (d) None of these

**Q-2 Answer the following questions in short. (Any seven) [7 X 2]**

- (1) Write the contribution of Antony van Leeuwenhoek in microbiology.
- (2) What are the characteristics of archaebacterial cell wall?
- (3) Differentiate between metachromatic and PHB granules.
- (4) What is capsule? Give examples of capsulated bacteria.
- (5) Explain- why fixation is an essential step prior to staining?
- (6) Differentiate between lithotrophs and organotrophs.
- (7) Write applications of Fluorescence microscopy.
- (8) Explain cryofracturing technique for Transmission Electron Microscopy.
- (9) What is prereduced media for the cultivation of anaerobic bacteria?

**Q-3 (a)** Discuss the findings of various scientists that contributed in the development of the Germ theory of Diseases. [06]

**(b)** What is spontaneous generation theory? Discuss the contributions of scientists who supported and disproved the spontaneous generation theory. [06]

**OR**

**(b)** Write a short note on Germ theory of Fermentation. [06]

**Q-4 (a)** Briefly discuss sporulation and germination process in bacteria. Give examples of spore producing bacteria. [06]

**(b)** Describe the fluid mosaic model of bacterial cell membrane with neat and labeled diagram. [06]

**OR**

**(b)** Write a short note on bacterial plasmid. [06]

**Q-5 (a)** Describe acid fast staining in detail with appropriate example. [06]

**(b)** Write a detailed note on phase contrast microscopy. [06]

**OR**

**(b)** Discuss principle, working and specimen preparation for Scanning Electron Microscope. [06]

**Q-6 (a)** Summarize the common ingredients of culture media and discuss different types of bacteriological media in brief. [06]

**(b)** Discuss various methods for the preservation of pure culture. [06]

**OR**

**(b)** Classify the bacteria on the basis of their nutritional requirements. [06]

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