

F Y PII NOV 2018

Q I A Define the following terms:

[05]

Contaminated culture: When unwanted microbe of uncertain identity is there in pure culture.

Negative staining: A staining procedure that employs an acidic stain whereby the background and not the cells are stained.

Defined medium: A medium in which all chemical components are known.

Pasteurization: the process of heating milk and other liquids to destroy microorganisms that can cause spoilage or disease.

Phenol co-efficient: The ratio between the greatest dilution of a test germicide capable of killing a test organism in 10 min but not in 5min and the greatest dilution of phenol giving the same result.

QIB State True or False

[05]

- 1) Steam sterilization and incineration are used to destroy micro-organisms. **TRUE**
- 2) Focal length is the distance between the center of the lens and the focal point. **TRUE**
- 3) Glucose is not a growth factor. **TRUE**
- 4) Heat as a killing agent is more effective under acidic condition. **TRUE**
- 5) For practical application 70% concentration of alcohol is used for disinfection. **TRUE**

QIC Give one example for each of the following:

[05]

- 1) Differential medium: **SIBA or MacConkey or Salt mannitol agar.**
- 2) Material sterilized by hot air oven: **Glassware or paraffin oil.**
- 3) An aldehyde which exhibits antimicrobial activity.: **formaldehyde, Glutaraldehyde**
- 4) Basic dye: **Crystal violet, Basic Fuchsin [any dye that stains bacteria]**
- 5) An objective used to observe stained bacteria. **100X or oil immersion lens.**

QID Select the correct alternative and rewrite the statement:

[05]

- 1) Bacterial colonies can be circular in shape.
- 2) Benzalkonium chloride is a **cationic** detergent.
- 3) A **phase-contrast** microscope converts slight differences in Refractive Index into brightness changes in image.
- 4) **Chlorine** is used as disinfectant for treatment of municipal water supplies.
- 5) Metachromatic granules are stained by **Albert's** method.

QII. Answer briefly any two of the following:

[20]

- 1) Discuss Periodic transfer, soil stock, overlay with mineral oil and glass bead techniques as methods for preservation of bacteria. [Preservation of bacteria (2 marks) each preservation method 2marks each Pelczar, 5th ed. 141,142]
- 2) What are complex media? Give the role of peptones, yeast extract, beef extract and agar in culture media. [Prescott 7th 111, complex media-1mark, peptones, BE, YE & agar 2marks each]

Q III A. Answer briefly any three of the following:

[18]

- 1) Give the principle of Phase-contrast microscopy. State the importance of phase-shifting element and annular diaphragm. [2 marks each Prescott 7th pg 21,23]
- 2) Discuss any two major classes of dyes giving examples and importance in staining. [Modi 229-230, Prescott 7th pg 26]
- 3) Discuss the different types of fixatives [3marks] and their importance [3 marks] in staining methods. [Modi 247 or Prescott 7th pg 25-26]
- 4) Name the staining method by which bacterial cell wall is stained, [Chances method-1 mark] state its principle [Journal 4 marks] and comment why smear is not heat fixed in this method. [heat treatment will distort the cells and hence its wall- 1 mark]
- 5) Briefly describe the historical path to development of a light microscope. [as taught in class]
- 6) Discuss the different objectives with respect to their properties and importance. [10X,45X,100X- each property [NA, working distance, Resolving power and magnification + 2 marks. Prescott 7th pg 20-21]

Q III B Do as directed any two of the following:

[02]

- 1) State the importance of Congo red in Maneval's method. [To create the contrast blue background so as to visualize the capsule]
- 2) Define a simple Microscope. [consists of only one lens in a frame]
- 3) example of a differential staining method. [Gram staining, ZNCF, Fields staining]
- 4) Name a bacterium that will show endospore on staining by Schaeffer - Fulton's method. [Bacillus species, Clostridium species]

QIVA Answer any three of the following:

[18]

- 1) Write short note on: Radiations and their use in sterilization. [Gamma & UV- Pelczar 481-482/Prescott 7th pg156-157]
- 2) Discuss the mode of action, advantages and limitations in the use of alcohol and aldehydes as an antimicrobial agent. Prescott 7th 159-160,163
- 3) Discuss the mode of action, use and limitation in use of chlorine as a disinfectant. [Prescott 161,163]
- 4) Compare and contrast: Pasteurization and Inspissation. Pelczar, 5th ed.477,478,622-623
- 5) Explain the principle, working and precautions while using autoclave for sterilization. Prescott 7th pg 153, Pelczar, 5th ed.476-477
- 6) Explain the role of population composition and concentration of an antimicrobial agent on the effectiveness of antimicrobial agents. [Prescott 7th pg152, Pelczar, 5th ed.471-473]

QIV B Do as directed any two of the following:

[02]

- 1) Name a heavy metal which is an effective algicide. Copper sulphate
- 2) Which cellular component does ethylene oxide react with when it functions as a microbicidal agent? Cell proteins
- 3) What happens to cells when placed in a hypotonic environment? Plasmolysis, passage of water from low concentration into the cell may lead to bursting of cells.
- 4) A sterilizing gas: EtO, H₂O₂, Betapropiolactone

QVA. Answer any three of the following**[18]**

- 1) differential medium with a suitable example. Prescott 7th pg 111-112 Talaro 7th ed. 6
- 2) How are micro-organisms grouped on the basis of their oxygen requirement? Brock, 11th ed. 16
- 3) Briefly explain why micro-nutrients are required by micro-organisms. (3 marks) Enlist three micronutrients and their exact role (3 marks) [Prescott 7th pg101-102]
- 4) Describe the major nutritional groups of microorganisms giving one example for each. [Prescott 7th pg103]
- 5) Discuss the major classes of growth factors? (4 marks) [Prescott 105] List any two (2 marks) macroelements that exist in cell as cations. [Ca^{2+} , Mg^{2+} , K^+ , Fe^{2+} or Fe^{3+}]
- 6) pure cultures? (2 marks) [Prescott 7th pg113] Pour plate method performed? (4 marks) [Prescott 115]

QVB Do as directed any two of the following:**02**

- 1) Give one example of a liquid medium used to grow bacteria. [NB, Peptone water, Tryptic soy broth]
- 2) List one microbial culture collection centre. [ATCC, MTCC, as taught in class]
- 3) State a word that describes the elevation of a bacterial colony. [flat, raised, convex, Pulvinate, Umbonate]
- 4) Name one supportive medium. [tryptic soy broth]
