FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
DEPARTMENT OF MICROBIOLOGY
FIRST SEMESTER EXAMINATIONS 2013/2014 ACADEMIC SESSION

MCB 312: Principles of Sterilization and Disinfection

Instructions: Answer All Questions in Section A on the paper. Time Allowed: 90 Minutes

Matric. No:…….. Name……

SECTION A

1. What would be the phenol coefficient of a disinfectant Y, given a phenol dilution of 1:25 and a maximum effective dilution for the disinfectant Y as 1: 500.

2. Calculate the total number of *Pseudomonas aeruginosa* cells, after 8 hours, in a pot of okro soup which had an initial contamination of 100 cells, given a generation time of 30 minutes per cell.

3. Find to the nearest whole number, the initial microbial contamination of a grape fruit juice with a total number of 5.0×10^4 cells, after 5 hours, given a generation time of 30 minutes per cell.

4. If the phenol dilution in a phenol coefficient test is 10:25 and the maximum effective dilution from a disinfectant X was 160:200, determine from your calculation whether or not disinfectant X was effective.

5. What is the generation time of a culture of *Vibrio cholerae* containing 3×10^3 cells with an initial contamination of 5 cells, following 6 hours of incubation at 37^o C?

6. Hepatitis-A is unstable to ……
   (a) considerable heating
   (b) sterilization
   (c) drying
   (d) effect of most chemicals

7. The shortest period of time needed to kill all organisms in a microbial suspension is
   (a) TDT
   (b) Z- value
   (c) D-value
   (d) TDP

8. Microbial growth is physiological activity that **does not** involve
   (a) cell division
   (b) entrance of basic nutrients into a cell

(c) replication of the chromosome
(d) toxin production

9. During the pre- exponential phase, bacterial cells in a medium usually
(a) grow very slowly
(b) remain undividing
(c) grow very fast
(d) adjust to the medium

10. All of the following are examples of disinfectants **except**
(a) Water at 100^{o}C
(b) Ceptol
(c) Dettol
(d) Izal

11. One of the following is not a means of ascertaining the viability of sterilization by autoclaving
(a) Death of the test bacterium
(b) Appearance of the word 'sterile'
(c) Change in colour of the paper strip autoclaved with the material
(d) Appearance of sterile water on the autoclaved material

12. Plotting the number of cells of a microbial culture in its exponential phase against time on non-logarithmic scale would give
(a) a linear function
(b) an inaccurate line
(c) a non-linear function
(d) a straight line graph

13. The lowest temperature at which a microbial suspension is killed in 10 minutes is known as
(a) TDP
(b) TDT
(c) PDP
(d) F- value

14. The difficulties associated with establishing the true resistance of viruses to disinfectants is attributed to all of the following except
(a) The time of exposure to the disinfectants
(b) Difficulties in determining the effectiveness of the disinfectants
(c) Relative difference in the structure of the nucleocapsid
(d) Poor knowledge of the concentration needed to inactivate viruses

15. The time required for a complete fission cycle in bacteria could be referred to all of the following **except**
    (a) Generation time
    (b) Bacterial growth
    (c) Doubling time
    (d) none of the above

16. In the eradication of the Hepatitis-A virus, ……. Is usually the preferred method
    (a) thorough disinfection
    (b) sterilization
    (c) drying
    (d) boiling

17. Heating of canned foods is usually done to eliminate the risk of food poisoning arising from the spores of
    (a) *Clostridium botulinum*
    (b) *Staphylococcus epidermidis*
    (c) *Aspegrillus niger*
    (d) Clostridium *perfringes*

18. Name **five** laboratory techniques used for measuring bacterial growth.

19. Name **four** viral units whose resistance to disinfection could be compared to that of *Mycobacterium tuberculosis*.

20. State the **five** physiological activities associated with microbial growth.

SECTION B

1(a) As a microbiologist, what major factors would you consider before selecting a chemical agent for sterilization.
1(b). List five major groups of chemical antimicrobial agents.
2(a). How do antimicrobial agents inhibit or kill microorganism.
2(b). List five physical agents uses in the control of microorganisms.
3. Write short note on the following:
    (i) Disinfection
    (ii) Sterilization
    (iii) Microbicide
    (iv) Microbiostatic agent
    (v) Disinfectant