



BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme – Bachelor of Science in Microbiology

Course Name – Bacteriology

Course Code – BMBC102

(Semester – 1)

Time allotted: 2.5 Hours

Full Marks: 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group –A

(Multiple Choice Type Question)

20 x 1 = 20

1. *Choose the correct alternative from the following (Answer any Twenty)*
 - (i) In the classification of bacteria according to shape, which among the following refer to cuboidal arrangement of bacterial cells?

a. Tetrads	b. Staphylococci
c. Sarcinae	d. Streptococci
 - (ii) Bacteria with less than a complete twist or comma shaped are known as?

a. Spirilla	b. Helical
c. Vibrioid	d. Spirochetes
 - (iii) The inventor of Microscope is

a. Galileo Galilei	b. Antony von Leeuwenhoek
c. Louis Pasteur	d. Robert Koch
 - (iv) Light gathering capacity of Microscope is called

a. Numerical aperture	b. Angular aperture
c. Both a and b	d. None of these
 - (v) The bacterial pili mainly contain

a. Carbohydrates	b. Lipids
c. Proteins	d. Minerals
 - (vi) Bacterial capsule is chemically composed of

a. Polypeptide	b. Polynucleotides
c. Polysaccharides	d. Polypeptides or polysaccharides

- (vii) The action of alcohol during Gram staining is
- | | |
|--------------------------|---------------------|
| a. Allows the color | b. It imparts color |
| c. Decolorizes the cells | d. None of these |
- (viii) Thermal death time is
- | | |
|---|---|
| a. Time required to kill all cells at a given temperature | b. Temperature that kills all cells in a given time |
| c. Time and temperature needed to kill all cells | d. All of the above |
- (ix) The condition required for autoclave
- | | |
|---|---|
| a. 121°C temp. and 15 lbs. pressure for 20 min. | b. 120°C temp. and 20 lbs pressure for 30 min |
| c. 150°C temp. for 1 hr. | d. 130°C temp for 2 hr. |
- (x) Spores are killed by
- | | |
|----------------|-------------------|
| a. 70% alcohol | b. Glutaraldehyde |
| c. Autoclaving | d. Both b and c |
- (xi) The bacterial cells are at their metabolic peak during
- | | |
|---------------------|------------------|
| a. Lag phase | b. Log phase |
| c. Stationary phase | d. Decline phase |
- (xii) Bacterial cell wall mainly composed by
- | | |
|------------------|------------|
| a. Peptidoglycan | b. Lipids |
| c. Protein | d. Vitamin |
- (xiii) Bacterial ribosomes are
- | | |
|--------|--------|
| a. 80s | b. 70s |
| c. 40s | d. 60s |
- (xiv) Generation time of *E. coli* is ____ minute.
- | | |
|-----------|-----------|
| a. 20 min | b. 10 min |
| c. 5 min | d. 15 min |
- (xv) NAM means:
- | | |
|--------------------------|--------------------------|
| a. N-acetyl murein | b. N-acetyl muramic acid |
| c. N-acetyl muramic acid | d. Both a and b |
- (xvi) Component responsible for bacterial endospore resistance is
- | | |
|--------------------|---------------------|
| a. Ca-dipicolinate | b. Na-dipicolinate |
| c. Colinic acid | d. all of the above |
- (xvii) BacT/Alert system monitor the presence and production of
- | | |
|--------------------|-------------------|
| a. CO ₂ | b. O ₂ |
| c. SO ₂ | d. N ₂ |

- (xviii) Temperature in pasteurization is
- a. 62.8°C
 - b. 35.7°C
 - c. 68.2°C
 - d. 60.8°C
- (xix) Lyophilization means
- a. Sterilization
 - b. Freeze-drying
 - c. Burning to ashes
 - d. Exposure to formation
- (xx) Log-phase is also known as
- a. Death phase
 - b. Exponential phase
 - c. Lag-phase
 - d. None of these
- (xxi) In Gram staining, the counter stain is
- a. Crystal violet
 - b. Iodine
 - c. CV-I complex
 - d. Safranin
- (xxii) 'Eyepiece' can be termed as:
- a. Ocular
 - b. Objective
 - c. Both a and b
 - d. Condenser
- (xxiii) The correct order of Gram staining is:
- a. Crystal violet-iodine-alcohol-safranin
 - b. Iodine-Crystal violet-alcohol-safranin
 - c. Crystal violet-iodine-safranin-alcohol
 - d. Crystal violet-alcohol-iodine-safranin
- (xxiv) The general pressure at which the autoclave is operated is:
- a. 15 psi
 - b. 15 lb
 - c. 5 psi
 - d. 5 lb
- (xxv) Which one is best for the long term storage?
- a. Store at -70°C
 - b. Store at -10°C
 - c. Store at room temperature
 - d. Store at -4°C

Group – B

(Short Answer Type Questions)

4 x 5 = 20

Answer any *four* from the following

- | | |
|---|-------|
| 2. Bacterial growth curve is semi logarithmic curve- explain. What is Diauxic growth? | 3+2 |
| 3. Briefly describe how antibiotics such as penicillins affect bacteria and relate this to their cell wall synthesis. | 5 |
| 4. What is the structure of peptidoglycan? How does it differ in gram-negative and gram-positive bacteria? | 3+2 |
| 5. What are differential and enrichment media? Site one example each. Does nutrient agar act as a semisynthetic medium? | 2+1+2 |
| 6. State different preservation procedures of microorganism. Why does low temperature is preferred for preserving microorganisms? | 4+1 |
| 7. Write down the mechanism of action of enzymes acting on bacterial cell wall. What is labiase? | 4+1 |

Group – C

(Long Answer Type Questions)

2 x 10 = 20

Answer any *two* from the following

- | | |
|--|---|
| 8. (a) Explain in detail the stages in bacterial sporulation process. | 8 |
| (b) Why is an endospore called a resting structure? | 2 |
| 9. (a) Diagrammatically represent various shapes and arrangement of bacteria. | 8 |
| (b) What are methanogens? Give one example. | 2 |
| 10. (a) Derive the mathematical equation for growth curve of bacteria. | 8 |
| (b) Describe the significance of growth measurement. | 2 |
| 11. (a) Write short notes on Glycocalyx and bacterial plasmids. | 6 |
| (b) Explain how the flagellum operates to impart movement to a bacterial cell. | 4 |