



BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme – Bachelor of Science in Biotechnology

Course Name – General Microbiology

Course Code – BBTH010401

(Semester – 1)

Time allotted: 3 Hours

Full Marks: 70

[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) For the examination of microbial cells we require the use of?

- | | |
|--|---|
| a. High-power microscope | b. Low-power microscope |
| c. High-power microscope at a magnification of about 1,000 diameters | d. Low-power microscope at a magnification of about 1,000 diameters |

(ii) What are the blood serum proteins produced by animals called?

- | | |
|----------------|---------------|
| a. Enzymes | b. Antibodies |
| c. Amino acids | d. Toxins |

(iii) The DNA of *Klebsiella pneumonia* has a moles % G+C content of?

- | | |
|----------|----------|
| a. 70-71 | b. 50-53 |
| c. 56-58 | d. 32-35 |

(iv) What are ribosomes composed of:

- | | |
|-------------|---------------------|
| a. Proteins | b. DNA |
| c. RNA | d. Proteins and RNA |

- (v) Gram-positive bacteria are usually more susceptible to?
- | | |
|-----------------|----------------|
| a. Streptomycin | b. Tetracyclin |
| c. Penicillin | d. Ampicillin |
- (vi) What is the approximate size of the bacterial cell?
- | | |
|-----------------------------|--------------------------------------|
| a. 2 mm in diameter | b. 1 mm in diameter |
| c. 2 micrometre in diameter | d. 0.5 to 1.0 micrometre in diameter |
- (vii) Bacteria with less than a complete twist or comma shaped are known as?
- | | |
|-------------|----------------|
| a. Spirilla | b. Helical |
| c. Vibrioid | d. Spirochetes |
- (viii) The L Ring in a Gram-negative bacterium flagella is associated with:
- | | |
|-------------------------|-------------------|
| a. Peptidoglycan | b. Outer membrane |
| c. Cytoplasmic membrane | d. Cell membrane |
- (ix) The outer membrane of the Gram-negative cell wall is anchored to the underlying peptidoglycan by means of which of the following?
- | | |
|------------------------|-----------------------|
| a. Braun's Lipoprotein | b. Phospholipids |
| c. Proteins | d. Lipopolysaccharide |
- (x) Which of the following are present in teichoic acids?
- | | |
|---------------------|---------------------------------|
| a. ribitol residues | b. glycerol residues |
| c. glucose residues | d. ribitol or glycerol residues |
- (xi) Bayer's junctions are sites which help in joining which of the following?
- | | |
|---|---|
| a. cytoplasmic membrane and outer membrane | b. outer membrane and capsule |
| c. cytoplasmic membrane and periplasmic space | d. peptidoglycan layer and cytoplasmic membrane |
- (xii) During exponential growth, the growth rate is:
- | | |
|--|----------------------------------|
| a. number of generations per unit time | b. reciprocal of generation time |
| c. both (a) and (b) | d. none of these |
- (xiii) Antimicrobial constituents for the microbial growth in foods are:
- | | |
|---------------------|---------------------|
| a. intrinsic factor | b. extrinsic factor |
| c. both (a) and (b) | d. none of these |

- (xiv) Which of the following is the suitable temperature range for mesophiles?
- 20-30°C
 - 25-40°C
 - >40°C
 - None of these
- (xv) A culture broth tube was very turbid at the bottom of the tube but clear at the top of the tube indicating that the
- broth is sterile
 - organism can tolerate oxygen
 - organism cannot produce superoxide dismutase and/or catalase
 - organism should be grown in an anaerobic chamber
- (xvi) In the exponential phase, the cells and cell mass:
- first increases then decreases
 - decreases
 - are constant
 - double at a constant rate
- (xvii) Quantitative measurement of bacterial growth can be carried out by measuring:
- cell count
 - cell mass
 - cell activity
 - all of these
- (xviii) Bacteria of genus *Nitrosomonas* use their electron source as:
- Ammonia
 - H₂S
 - Succinate
 - Light
- (xix) The period between inoculation of bacteria in a culture medium and beginning of multiplication is known as
- stationary phase
 - log phase
 - lag phase
 - decline phase
- (xx) The phage is incorporated in the bacterial genome by:
- Single crossover event
 - Two crossover event
 - Three point recombination
 - Four crossover event
- (xxi) What will be the virulence of the viruses produced by a healthy bacterial cell infected with a specialized transducing virus?
- They will be more virulent than original one
 - They will be equally virulent as original one
 - The virulence will depreciate
 - No virulence

- (xxii) A specialized transducing phage attacking an infected cell with lysogenic stage of the same virus gives rise to:
- | | |
|--------|--------|
| a. HFR | b. HFT |
| c. F' | d. F |
- (xxiii) Which of the following role is performed by a bacteriophage in transduction?
- | | |
|--------------|------------|
| a. Vector | b. Donor |
| c. Recipient | d. episome |
- (xxiv) What is the correct order when coliphage P1 is grown in a thr⁺ leu⁺ azi^R host is used to infect a thr⁻ leu⁻ azi⁻ recipient bacterial cell?
- | | |
|---|---|
| a. thr ⁺ leu ⁺ azi ^R | b. thr ⁻ leu ⁺ azi ^R |
| c. thr ⁺ leu ⁻ azi ^R | d. thr ⁻ leu ⁻ azi ^R |
- (xxv) Which among the following come under Gram-positive eubacteria?
- | | |
|----------------|-----------------|
| a. Clostridium | b. Actinomyces |
| c. Rhizobium | d. Both a and b |

Group – B

(Short Answer Type Questions)

4 x 5 = 20

Answer any *four* from the following

- | | |
|---|---|
| 2. Briefly describe the classical approach to determine taxonomical characters. | 5 |
| 3. Elucidate the general characteristics and structure of virus. | 5 |
| 4. Explain in brief “Transduction”. | 5 |
| 5. Elucidate Lederberg’s “Replica-plating technique”. | 5 |
| 6. Classify micro-organisms on the basis of nutritional requirements. | 5 |
| 7. Describe “Growth rate” and “Generation time”. | 5 |

Group – C

(Long Answer Type Questions)

3 x 10 = 30

Answer any *three* from the following

- | | | | |
|-----|-----|--|---|
| 8. | (a) | Elucidate in detail the concept of "Autotrophy". | 5 |
| | (b) | What are the three categories of autotrophic microbes? | 5 |
| 9. | (a) | What is the generation time of a bacterial population that increases from 40,000 cells to 4, 00, 00,000 cells in four hours of growth? | 5 |
| | (b) | Write short notes on sulphur and non-sulphur bacteria. | 5 |
| 10. | (a) | Explain psychrophiles, mesophiles and thermophiles. | 2 |
| | (b) | What are facultative anaerobes and microaerophilic microbes? | 2 |
| | (c) | Diagrammatically represent "Gaspak Anaerobic System". | 2 |
| | (d) | What are the factors influencing antimicrobial activity? | 4 |
| 11. | (a) | Explain in detail "Moist-heat sterilization". | 5 |
| | (b) | Elucidate "Dry-heat sterilization" and "Dessication". | 5 |
| 12. | (a) | Explain "Antiseptics". | 2 |
| | (b) | Describe in brief how halogens control microbial growth. | 2 |
| | (c) | Enlist the various microbicidal compounds. | 2 |
| | (d) | Write short notes on "Alcohol sterilization" and "Gaseous sterilization". | 4 |
