BRAINWARE UNIVERSITY

Term End Examination 2018 - 19

Programme – Bachelor of Science (Honours) 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) 10 x 1 = 10

1. *Choose the correct alternative from the following*

(i) Who proposed five-kingdom classification system?

a. Carl Woese. b. Robert Whittaker.

c. Cavalier-Smith. d. Norman Pace.

(ii) Which among the following is called as filamentous bacteria?

a. Mycoplasmas. b. Spirochetes.

c. Actinomycetes. d. Vibrios.

(iii) Which of the following causes food-borne intoxication?

a. Staphylococcus aureus. b. Escherichia coli.

c. Listeria monocytogenes. d. Salmonella typhimurium.

(iv) Thiobacillus novellusis is a;

a. Facultative chemolithotroph. b. Obligate chemolithotroph.

c. Obligate photolithotroph. d. Facultative photolithotroph.

(v) "Specialized transduction" was discovered by;

a. Zinder and Lederberg in 1952 b. Morse and Lederberg in 1956

c. Avery, Macleod and McCarty in 1944 d. Lederberg and Tatum in 1946

(vi) The generation time of *Escherichia coli* in milk at 37ºC is;

a. 20 minutes. b. 12 minutes.

c. 11 minutes. d. 25 minutes.

(vii) Solid CO_2 is used to preserve and maintain bacterial cultures in;

a. Saline suspension. b.Vacuum drying.

c. Liquid nitrogen freezing. d. Freeze drying.

(viii) The smell of earthy odour after first rain is due to;

a. *Streptomyces somaliensis.* b. *Actinomyces odontolyticus.*

c. *Actinomyces israelii.* d. *Actinomyces naeslundii.*

(ix) A false positive presumptive test for coliforms is obtained due to the presence of;

a. *Escherichia coli.* b. *Aerobacter aerogenes.*

c. *Clostridium tetani.* d. *Clostridium perfringens.*

(x) The "putrefaction" of fresh meat is caused by;

a. *Chromobacterium lividum.* b. *Chromobacterium violaceum.*

c. *Chromobacterium subtsugae.* d. *Lactobacillus lactis.*

Group – B

(Short Answer Type Questions) 3 x 5 = 15

Answer any *three* from the following :

2. Write a note on the contribution of Louis Pasteur. 5

3. Elucidate the preservation methods for the maintenance of microbial organisms in viable condition over long periods. 5

4. Briefly explain the three principal methods for water purification. 5

5. What is 'F' factor and explain the results obtained from crossing 'F' strains together. 5

6. Describe in brief the morphology of "lambda" phage along with its life cycles. 5

Group – C

(Long Answer Type Questions) 3 x 15 = 45

Answer any *three* from the following:

7. (a) Classify "Gram negative" bacteria according to eighth edition of *Bergey's manual of determinative bacteriology.* 8

(b) Derive the mathematical expression of growth, 'n' and 'K', where 'n' = number of generations and 'K' = exponential growth rate constant. 7

8. (a) Distinguish between F^+, Hfr, and F' conjugation processes in terms of mechanism and what would be the final results. 7

(b) Elucidate the structure and function of the "temperate ds DNA" phage. 8

9.	(a)	Explain the different apparatus developed to grow microbes in continuous culture.	8
	(b)	What is the generation time of a bacterial population that increases from 20,000 cells to 20,000,000 cells in four hours of growth?	7
10.	(a)	Describe the "bacterial growth curve".	6
	(b)	Describe in detail about different physical agents used to control microorganisms.	6
	(c)	What is exponential growth rate constant, 'K' if the generation time of *E. coli* is 30 minutes?	3
11.	(a)	Explain "Synchronous culture".	3
	(b)	Describe in detail "Breed method" and "Electronic counter" for direct determination of the number of bacterial cells.	6
	(c)	What will be the number of cells per mL of suspension if an average count of 6 particles and 60 cells per field is obtained with 20,000 as the number of particles per mL of suspension?	3
	(d)	What is "plate count" method to determine the number of bacterial colonies? Enumerate the bacteria per mL if 1 x 10^{-9} dilution plate with 0.1 mL of the diluted cell suspension counted 300 bacteria.	3
