

Five Year Integrated M.Sc. Examination, 2017

Semester - VI

Course: LS-3-6-1

(Life Science: Microbiology)

Time: Four Hours

Full Marks: 80

Questions are of value as indicated in the margin.

Answer **Question No.1** and **any six** from the rest.

1. Answer **any ten** of the following: 2x10=20
 - a) What is CFU count?
 - b) What is a minimal media and a rich media?
 - c) What are filterable agents? Why are they called so?
 - d) What is the difference between a batch culture and a continuous culture?
 - e) What are bacterial secondary metabolites? Give one example.
 - f) What is the difference between a virus and a virion?
 - g) Draw and label the structure of a Gram negative bacterial flagellum.
 - h) Which chemicals can be used to induce competence in bacteria?
 - i) What is the purpose of adding DNase in Davis U-tube experiment. Explain.
 - j) Name one Gram positive and one Gram negative bacterium upto species level. Mention one signature molecule present in each of them.
 - k) What is SCP?
 - l) What is cheese?
2.
 - a) What is the difference between simple and differential staining processes?
 - b) Describe the working principle of Gram staining citing the role of each chemicals used in the process.
 - c) What properties in the cell wall structure of bacteria lead to their division into Gram positive and Gram negative groups? 2+4+4=10
3.
 - a) What are F⁺, F' and Hfr strains of *E. coli*?
 - b) What is the difference between a prototroph and an auxotroph?
 - c) Describe the process of Hfr x F⁻ conjugation. 3+2+5=10
4.
 - a) Mention the differences between lytic and lysogenic cycles of a virus?
 - b) Describe the process of transduction in brief. 5+5=10
5. Describe the growth curve of a typical virus and a bacterium. 5+5=10
6.
 - a) Describe briefly with suitable labeled diagrams the structure of T2 and HIV virus.
 - b) Explain why one of them is enveloped while the other is not. (4+5)+1=10
7.
 - a) What is the difference between a viroid and a prion?
 - b) Give one example of a disease caused by them.
 - c) What is the difference between PrP^C and PrP^{SC} proteins and explain how they help in forming prion related disease?
 - d) From where are these proteins coded? 2+1+(3+3)+1=10
8. Write short notes on the following: 2.5x4=10
 - a) Plasmid
 - b) Lysogenic immunity
 - c) Interrupted mating experiment
 - d) Griffith's experiment of transformation

P.T.O.

(2)

9. Write short notes on:

- a) Louis Pasteur's 'Swan neck flask experiment'
- b) Importance of bacteria in the field of environment
- c) Antibiotics (any two classes, 2 examples each and its mode of action)

2.5+2.5+5=10
