

**End Semester Examination, 2021**

**Semester - III**

**Human Physiology (Special Paper)**

**PAPER - PHY. 303 (U27 & U28)**

**(MICROBIOLOGY and IMMUNOLOGY)**

*Full Marks : 40 (20+20)*

*Time : 2 Hours*

**UNIT - 27**

**(ADVANCED STUDIES IN MICROBIOLOGY)**

**1. Answer any two from the following :- 2x2=4**

- a) Name two nitrogen fixing bacteria. 1+1
- b) State the importance of microbes in bioremediation. 2
- c) What is the basis of biofilm formation by bacteria? 2
- d) What are xenobiotics? Give example. 2

**2. Answer any two questions from the following :- 2x4=8**

- a) Enumerate the importance of the gut microflora in humans. 4
- b) Differentiate between the C3 and C4 microbes. 4
- c) How secondary treatment is done of sewage waste by microorganisms? 4
- d) How virulence affects the host-microbe interaction? 4

**3. Answer any one of the following :- 1x8=8**

- a) Describe the host factors in the host-parasite relationship. 8

- b) Describe the nitrogen cycle with a suitable flow chart. 8

### UNIT - 28

#### (CELLULAR and MOLECULAR IMMUNOLOGY)

**1. Answer any two from the following questions :-**

**2x2=4**

- a) What is the significance of CD4 and CD8 receptors of the T Cell? 1+1
- b) Define immunological synapse. 2
- c) What is meant by HLA typing? 2
- d) State the importance of Bcl-2 protein in apoptosis. 2

**2. Answer any two from the following :- 2x4=8**

- a) Explain the positive and negative selection of the naive T cells in the course of its maturation. 2+2
- b) Explain the endogenous process of antigen presentation by its suitable MHC class. 4
- c) Specify the importance of Co-stimulatory signal with two suitable examples. 2+2
- d) How cytokine storm causes pathogenesis in recently occurring pandemic? 4

**3. Answer any one from the following :- 1x8=8**

- a) Explain the process of T cell-B cell cooperation with suitable diagrams. 4+4
- b) Explain the principle behind Antibody diversity. What do you mean by clonal selection and class switching? 4+2+2