

**2022**

**Human Physiology**

**[P.G.]**

**(M.Sc. Third Semester End Examination-2022)**

**PAPER-303**

**Full Marks:40**

**Time: 02 Hrs**

*The figures in the right hand margin indicate marks*

*Candidates are required to give their answers in their own words as far as practicable*

*Illustrate the answers wherever necessary*

**[Use separate Answer Script for each group]**

**Unit – 27**

**Marks 20**

**[Advanced Studies in Microbiology]**

**1. Answer any two questions of the following: 2x2= 4**

- a) What are xenobiotics?
- b) Write down the differences between pathogenicity and virulence.
- c) What are chemolithotrophs? Give one example. 1+1
- d) Name the genes involved in nitrogen fixation process.

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

- a) What are oil-eating microbes?  
Write a short note on bioremediation. 1+3

(2)

- b) Nitrosomonas and Nitrobacter are two groups of bacteria that carry out nitrification. Explain this process and why is it so important to soil fertility? 3+1
- c) What is microbial flora? Where in human body the normal flora are commonly found. Name two flora along with their site occurrence human body. 1+2+1
- d) Describe the Calvin Cycle with schematic representation. What is the significance of C4 cycle? 3+1

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

- a) What is meant by microbial ecology? What are the ecological niche and microenvironment? What are the different traditional & molecular techniques involved in microbial ecology studies? 2+2+4
- b) Describe in details the carbon cycle with schematic flow diagram.  
Differentiate between cyclic and non-cyclic photophosphorylation. 6+2

Unit – 28

Marks 20

[Cellular and Molecular immunology]

1. Answer any two questions of the following: 2x2= 4

- a) What is the significance of co-stimulatory signals?
- b) What is T cell anergy?

(3)

- c) How does bone marrow stromal cells take part in B cell development?
- d) What is peptide left? Write down the functions of MHC.

2. Answer any two questions of the following: 2x4 = 8

- a) Differentiate between apoptosis and any necrosis. Write down the functional targets of  $P_{53}$  in controlling apoptosis. 2+2
- b) Explain the exogenous process of antigen presentation by its suitable MHC class, with a suitable diagram. 3+1
- c) Explain the V-D-J arrangement of the germ line of the Hchain of an antibody with a suitable diagram. 3+1
- d) Define class switching and clonal selection.

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

- a) Explain the structure of B cell with special emphasis on its Co-receptor complex with a suitable diagram.
- b) What is meant by immunoglobulin superfamily? Draw and describe the structure of Class II MHC.