

MANIPAL ACADEMY OF HIGHER EDUCATION

FOURTH SEMESTER BSc. HEALTH SCIENCE DEGREE EXAMINATION - JULY 2023 SUBJECT: BHS-208 - MICROBIOLOGY AND GENETICS (MAKEUP)

Marks: 75

Duration: 180 mins.

Durat

SECTION A: MICROBIOLOGY (25 MARKS)

1. Answer the following questions briefly.

- 1A) Mention any TWO uses of gram staining in diagnostic microbiology. (2)
- 1B) Draw and label the components of gram positive bacterial cell wall. (2)
- 1C) Write any TWO clinical conditions caused by Herpes simplex virus. (2)
- 1D) Mention the clinical manifestations of pulmonary tuberculosis. (2)
- 1E) List TWO functions of cytotoxic T lymphocytes. (2)
- 1F) List any FOUR articles sterilized using autoclave. (2)
- 1G) Write any TWO clinical manifestations of *Ascaris lumbricoides* infection. (2)

2. Answer the following questions.

- 2A) Enumerate THREE differences between Prokaryotes and Eukaryotes. (3)
- 2B) Describe the mode of transmission of HIV infection. (3)

3.. Answer the following question.

- Describe the antigenic variations seen in Influenza virus. (5)

SECTION B: GENETICS (25 MARKS)

4. Answer the following questions briefly.

- 4A) Explain the law of "purity of gametes". (2)
- 4B) List TWO similarities & TWO differences between mitochondrial & chloroplast DNAs. (2)
- 4C) What is pseudodominance and how is it produced by a chromosome deletion? (2)
- 4D) What is the difference between cytoplasmic inheritance and genetic maternal effect? (2)
- 4E) Write a note on humoral immunity. (2)
- 4F) Write a short note on the Lederberg-Zinder U-tube experiment of transduction in *Salmonella*. (2)
- 4G) Write a short note on different mechanisms employed by viruses to cause cancer. (2)

5. Answer the following questions.

- 5A) What are the various types by which bacteria transfer their genetic information? Define any TWO of them. (3)
- 5B) In a three-point cross-over experiment involving three autosomal genes vestigial wings (vg), black body (b) and purple eyes (pr) are recessive to normal wings (vg+), grey body (b+) and red eyes (pr+). A homozygous dominant

wild-type male drosophila with normal wings, grey body and red eyes is mated with a homozygous recessive female. The F1 progeny is then test-crossed to obtain the following progeny data.

Phenotype	
Normal wings, grey body and red eyes	1779
Vestigial wings, black body, purple eyes	1654
Normal wings, black body and purple eyes	252
Vestigial wings, grey body, red eyes	241
Normal wings, black body and red eyes	131
Vestigial wings, grey body, purple eyes	118
Normal wings, grey body and purple eyes	13
Vestigial wings, black body, red eyes	9

Calculate the gene order and the distance between the genes.

6.. Answer the following question.

Explain in detail how genetic mechanisms contribute to the generation of immunoglobulin diversity. (5)

