

**Rani Rashmoni Green University**

**M.Sc. 3<sup>rd</sup> Semester Examination, 2025**

**Subject: Nutrition and Public Health**

**Course code: GNPHT-34A (Unit 1- Cell Biology, Unit 2- Immunology)**

**Time: 2hrs**

**FM= 40**

**1. Answer any four out of six questions from the followings: 4×2= 8**

- a) What is the role of the Golgi apparatus?
- b) What are the forces involved in Ag-Ab interactions?
- c) Write the differences between optical microscope and TEM?
- d) Write the concept of herd immunity.
- e) Distinguish between epitope, paratope, and agretope?
- f) What are the different components of plasma membrane?

**2. Answer any four out of six questions from the following: 4x4=16**

- a) Write the immunological functions of primary and secondary lymphoid organs. 2+2
- b) Discuss the national immunization schedule.
- c) Explain the function of centrosomes in cell division. How do chloroplasts and mitochondria demonstrate endosymbiotic theory? 2+2
- d) State the principle of ELISA technique. Explain the role of Taq polymerase in PCR. What is the basis of separation in gel electrophoresis? 2+1+1
- e) Discuss mRNA vaccines (like COVID-19 vaccines), explaining their mechanism and advantages over traditional vaccines.
- f) What do you mean by Ag processing and Ag presentation? 1+3

**Answer any two out of four questions from the following: 2x8=16**

- a) What are the hypervariable regions (CDR) located on an antibody molecule? What are their functions? 3+5
- b) Write about components of mitochondria with suitable diagram. Compare smooth ER and rough ER based on structure and function. Which cell organelle is responsible and what genetic mutation causes progeria? What are the symptoms? 3 + 2+ 2 + 1
- c) Draw the structure of B-cell receptor. Describe the process of B cell activation, including T-dependent and T-independent pathways. 3+5

- d) Write the differences between gas chromatography and liquid chromatography. What is the advantage of MRI over CT scan? What is the purpose of ethidium bromide in DNA visualization? What is the mobile phase in GC? What does an A260/A280 ratio of 1.8 indicate?

2 + 2 + 1 + 1 + 1