JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS- 2025

MSc (Micro)-I Semester

COURSE CODE (CREDITS): 20B1WBI831 (2-0-0) MAX. MARKS: 25

COURSE NAME: VIROLOGY

COURSE INSTRUCTORS: Dr. Tyson MAX. TIME: 1 Hour 30 Min

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks
Q1	Discuss how modern molecular and immunological diagnostic methods together have improved early detection and management of viral diseases.	2
Q2	Sandwich ELISA is widely used for detecting viral antigens with high sensitivity and specificity. a) Design an experiment using sandwich ELISA to detect and quantify viral antigens in patient serum samples. Describe key steps such as antibody selection, coating, blocking, substrate use and signal detection. b) Explain how you would validate the assay for sensitivity and specificity, and compare its advantages over direct ELISA in viral diagnostics.	3+3
Q3	Outline the procedure for a Hemagglutination Inhibition (HI) test to detect influenza virus in serum. Describe how to determine the HI titer and identify one potential source of error.	3
Q4	Explain the role of host cell machinery in viral replication. Why are some viruses able to replicate only in specific cell types (tissue tropism)?	3
Q5	In the Complement Fixation Test, hemolysis is used as an indicator. How does the interaction between antibody, complement, and antigen determine the test outcome and why does the absence of hemolysis suggest a positive result?	4
Q6	Evaluate the mechanisms of action of nucleoside analogs like acyclovir and zidovudine in inhibiting viral replication. Discuss their specificity for viral enzymes, potential side effects due to off-target effects on host cells.	4
Q7	Cell culture is a fundamental tool for studying viral replication and testing antiviral agents. Describe the types of cell cultures commonly used in virology and their key characteristics.	3