



MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

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University Examinations 2023/2024

FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF MASTER OF SCIENCE IN MOLECULAR BIOLOGY

SIZE 5150: MOLECULAR VIROLOGY

DATE: APRIL 2024

TIME: 3 HOURS

INSTRUCTIONS: Answer question *one* and any other *two* questions

QUESTION ONE (30 MARKS)

- a) Describe any three viral family groups based on the Baltimore classification method (3 marks)
 - b) Define the following terms: virion, capsid, capsomere, nucleocapsid (2 marks)
 - c) Describe the major factor that determine the susceptibility of a cell to viral infection (2 marks)
 - d) Explain the mechanisms of virus entry and release from a host cell (4 marks)
 - e) Briefly describe the lysogenic and lytic cycles of a bacteriophage (2 marks)
 - f) Describe the properties and function of viral envelope proteins. How does the presence or absence of an envelope affect transmission properties of a virus? (4 marks)
 - g) Discuss heteroduplex mobility analysis (HMA) application in diagnostic molecular virology (5 marks)
 - h) Differentiate in details between productive and abortive viral infections (4 marks)
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- i) State the difference between positive sense and negative sense strand in ssRNA viral genomes

QUESTION TWO (20 MARKS)

Discuss viruses with small, double stranded DNA genomes

QUESTION THREE (20 MARKS)

Discuss the application of PCR in qualitative and quantitative detection of plant/animal viral infection

QUESTION FOUR (20 MARKS)

Discuss RNAi and its role in control of plant viruses