

**BOWEN UNIVERSITY, IWO**  
**COLLEGE OF AGRICULTURE, ENGINEERING AND SCIENCE**  
**MICROBIOLOGY PROGRAMME**  
**2022/2023 FIRST SEMESTER EXAMINATION**  
**MCB 417: VIROLOGY AND TISSUE CULTURE (THEORY)**

Answer Three questions in all with AT LEAST ONE from each section.

Time allowed: 2h 15min

**Section A**

1. (a) Discuss the **three** major components of viruses **(15 marks)**  
(b) With one example of the viral family each, list the 7 groups of viruses as classified by David Baltimore **(7 marks)**  
(c) Explain the term 'Cytopathic Effect' **(3 marks)**  
**(25 marks)**
  
2. Differentiate between the following:  
(a) Early proteins and Late proteins **(5 marks)**  
(b) Direct and Indirect ELISA **(5 marks)**  
(c) Arboviruses and Roboviruses **(5 marks)**  
(d) Genetic reassortment and Genetic recombination **(5 marks)**  
(e) Cell culture and Tissue culture **(5 marks)**  
**(25 marks)**
  
3. Describe the replication of viruses under the following terms:  
(a) Attachment **(5 marks)**  
(b) Membrane fusion **(5 marks)**  
(c) Uncoating **(5 marks)**  
(d) Transcription **(5 marks)**  
(e) Release **(5 marks)**  
**(25 marks)**

**Section B**

4. (a) Briefly comment on the roles of proto-oncogenes and suppressor genes in cancer formation **(10 marks)**  
(b) Discuss in detail the characteristics of Interferons **(15 marks)**  
**(25 marks)**
  
5. Discuss in detail the biological importance of the following family of viruses:  
(a) *Retroviridae* **(10 marks)**  
(b) *Herpesviridae* **(8 marks)**  
(c) *Rhabdoviridae* **(7 marks)**  
**(25 marks)**