



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2009/2010

FIRST SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
SCIENCE

HML 309: DIAGNOSTIC VIROLOGY

DATE: Tuesday, 29th December, 2009

TIME: 11.00 a.m. – 1.00 p.m.

INSTRUCTIONS:

SECTION A

Answer **ALL** questions (5 marks each)

1. Explain five mechanisms of virus transmission (5 marks)

2. Define the following terms:-
 - a) Specificity
 - b) A primer
 - c) Virion
 - d) Cytopathic effect
 - e) Latent infection(5 marks)

3. Outline five ways of preventing transmission of viral infections (5 marks)

SECTION B

Answer only **ONE** question from this Section. (20 marks each)

4. Describe four direct methods used in viral diagnosis (20 marks)

5. You have been asked to set up a district virology laboratory. But before you set up the laboratory, what factors will you consider to ensure viability of the project (20 marks)

SECTION C (MCQs, 15 marks)

INSTRUCTIONS:

Answer **ALL** questions. (30 MCQs, ½ marks each)

-¼ for **wrong** answers

Please **circle** the correct answer

1. Which one of the following statements is not true about viral infections?
 - a) Virus infections are all life threatening
 - b) A number of viruses cause similar symptoms
 - c) Virus infection may cause immunosuppression of the host
 - d) Some viruses require other viruses for their replication

2. Which one of the following viruses is not oncogenic?
 - a) Adenoviruses
 - b) HSV-2
 - c) HCV
 - d) EBV

3. Laboratory diagnosis of HIV infection is usually made by which of the following
 - a) Biochemical tests
 - b) Growth of virus in chicken embryo
 - c) Detection of antigen and antibodies
 - d) Light microscopy

4. Which of the following is the cause of smallpox?
- a) Varicella zoster
 - b) Variola virus
 - c) Vaccinia virus
 - d) None of the above
5. Viral infections of the eye include the following except
- a) Adenoviruses
 - b) Herpes simplex viruses
 - c) Varicella zoster virus
 - d) Respiratory syncytial virus
6. For proper diagnosis of viral infections, the following factors must be considered except
- a) Proper site selection
 - b) Collection method
 - c) Transport
 - d) Processing
 - e) Cost of the assay
7. Viruses can be disinfected by
- a) hydrogen peroxide
 - b) potassium permanganate
 - c) Hypochlorite
 - d) All of the above
8. Serological diagnostic test is used to detect for the presence of the following molecules except
- a) IgG
 - b) IgM
 - c) Antigen
 - d) Antibodies

9. Direct viral diagnostic technique include all of the following except
- a) Antigen detection
 - b) Antibodies
 - c) Light microscopy
 - d) Viral genome detection
 - e) Electron microscopy
10. Which statement is true about diagnostic techniques in general?
- a) Low sensitivity
 - b) High predicative values
 - c) Low specificity
 - d) May give a false positive or negative result
 - e) None of the above
11. Which statement among the following is true about viral genomes?
- a) Contain both DNA molecule and RNA molecule
 - b) Contain Reverse transcriptase and RNA molecule
 - c) Contain only DNA
 - d) Contain single stranded DNA or RNA molecule
 - e) None of the above
12. Which one of the following techniques below is not a virus quantification assay?
- a) PCR
 - b) NASBA
 - c) bDNA
 - d) Hybridization
 - e) DFA
13. What does the result “undetectable” mean in viral load assay?
- a) The patient is uninfected
 - b) The test is not valid

- c) The patient is infected but in a symptomatic phase
 - d) There is not enough virus for the test to find and count
 - e) None of the above
14. viral load testing may be helpful in
- a) Diagnosis
 - b) Medical research
 - c) Prognosis
 - d) Prevention
 - e) All of above
15. The following are cell culture types except
- a) Semi-continuous
 - b) Primary
 - c) Continuous
 - d) Haemagglutination
16. Which one of the following infections or diseases may cause an outbreak
- a) Influenza
 - b) Measles
 - c) Hepatitis B virus
 - d) Chickenpox
 - e) All of the above
17. Which of the following factors is not an essential consideration when designing a laboratory?
- a) Personnel training and qualification
 - b) Available space
 - c) Cost of equipment and reagents
 - d) Endemic viral infections

18. Sensitivity of a test may be defined as
- a) Absence of a disease when it is present
 - b) Presence of a disease when it is not present
 - c) The total number of true positives to the total number of true positives plus false negatives expressed in a percentage
 - d) The total number of true negatives to the total number of true negatives plus false positives expressed in a percentage
19. Which of the following statement is true
- a) In virus isolation methods, primary cell cultures are sub-cultured indefinitely
 - b) Cythopathic effect may be observed due to the swelling of cultured cells
 - c) All viruses contain lipids
 - d) Only RNA viruses contain reverse transcriptase enzyme
20. What is a primer?
- a) A short DNA sequence
 - b) A short RNA sequence
 - c) A short sequence of oligonucleotides
 - d) A promoter sequence
21. Good performance of PCR test must be carried out properly in clean, sample preparation and PCR amplification rooms. What is done in “clean room”?
- a) Preparation and storage of reagents, chemicals and enzymes
 - b) Extraction of viral nucleic acids
 - c) PCR/RT reactions
 - d) None of the above
22. Which antiviral antibody is mostly associated with chronic viral infection?
- a) IgG
 - b) IgM
 - c) Both

- d) None of the above
23. Which one of the following specimens may be ideal for virus isolation techniques from an infected patient?
- a) Urine
 - b) Stool
 - c) Blood
 - d) Cerebrospinal fluid
 - e) All of the above
24. Which virus diagnostic techniques below may be used for IgM detection during acute viral infection?
- a) PCR
 - b) NASBA
 - c) ELISA
 - d) Western Blot
 - e) None of the above
25. Which one of the following viruses can be transmitted by blood?
- a) HBV
 - b) HAV
 - c) HCV
 - d) HIV
 - e) HTLV-1
 - f) All of the above
26. Which one of the following viruses is transmitted from animals to humans?
- a) Poliovirus
 - b) CMV
 - c) Rabies virus
 - d) HIV

27. Which one of the following viral markers may not be of value in acute infections?
- a) Antigen
 - b) Antibody
 - c) DNA
 - d) RNA
28. All viruses contain
- a) A lipid glycoprotein
 - b) DNA
 - c) RNA
 - d) Protein
 - e) None of the above
29. Hepatitis B virus contains
- a) Ss RNA
 - b) Reverse transcriptase
 - c) Neuramidase
 - d) Ds RNA
 - e) None of the above
30. Which statement is correct about viruses in general?
- a) All viral structures are known
 - b) Are obligate extracellular parasites
 - c) Can grow in culture media
 - d) Enveloped
 - e) None of the above