

**MASENO UNIVERSITY****UNIVERSITY EXAMINATION 2015/2016****SCHOOL OF PUBLIC HEALTH AND COMMUNITY DEVELOPMENT****PHT: 112: HIV AND AIDS DETERMINANTS, PREVENTION AND MANAGEMENT**

CANDIDATE'S REGISTRATION NUMBER: \_\_\_\_\_

SCHOOL / FACULTY OF \_\_\_\_\_

DEGREE FOR WHICH CANDIDATE IS BEING EXAMINED \_\_\_\_\_

YEAR OF STUDY: \_\_\_\_\_

**DATE: 14<sup>TH</sup> DECEMBER 2015****TIME: 2.00 – 4:00PM****GENERAL INSTRUCTIONS**

1. Write your University Registration Number on every page of the question paper.
2. Do not write your name on any papers you use.
3. The Questions are set out in **Three (3) Sections A, B and C**
4. **Answer all Questions** in each section in the question paper
5. Section A has **Thirty (30) Multiple Choice Questions (MCQs)** (30 Marks)
6. Section B has **Thirty four (34) Short Answer Questions (SAQs)** (25 Marks)
7. Section C has **Three (3) Case Application Questions** (15 Marks)
8. Read very carefully the additional instructions preceding each Section
9. Answer all questions on the question paper as per instructions preceding each section



**Section A: MCQs: Answer all Questions (30 Marks)**

Circle the most appropriate option (Each correct answer is 1 mark)

- Which one of the following is NOT a negative health effect of smoking on people who are HIV-positive?
  - More likely to keep to their HIV treatment plan
  - Have a poorer response to antiretroviral therapy
  - Higher risk of developing lung cancer, head and neck cancers, cervical and anal cancers, and other cancers
  - More likely to develop bacterial pneumonia, *Pneumocystis jirovecii* pneumonia (PCP), COPD, and heart disease
  - More likely to develop two conditions that affect the mouth: *oral candidiasis* (thrush) and *oral hairy leukoplakia*
- The following factors may shorten the time between HIV and AIDS in a positive patient EXCEPT;
  - Older age
  - HIV subtype
  - Severe stress
  - Staying in HIV care
  - Co-infection with other viruses
- The following are risk factors associated with vertical transmission of HIV from mother-to-child EXCEPT;
  - Elevated maternal plasma viral loads
  - Having fewer copies of a gene that helps to fight HIV
  - Concurrent STIs and co-infection with either hepatitis C or active tuberculosis
  - Breastfeeding and associated co-factors such as duration and pattern of breastfeeding, maternal breast health, and high plasma or breast milk viral load
  - Mode of delivery and obstetric events, including prolonged rupture of membranes and intrapartum use of fetal scalp electrodes or fetal scalp pH sampling
- Which one of the following fluids transmits HIV?
  - Urine
  - Mucus
  - Semen
  - Sputum
  - Vomit
- Which one of the following is not associated with the chronic phase of HIV transmission?
  - Many patients have herpes zoster and/or oral thrush
  - Relative containment of the virus and clinical latency
  - Clinically, patients are either asymptomatic or develop persistent generalized lymphadenopathy
  - Immune system largely intact but virus replication continues for several years, predominantly in the lymphoid tissues
  - High level of virus production and viraemia widespread viral seeding of the lymphoid tissues and 1-2 billion CD4+ T-cells die each day
- Which one of the following opportunistic infections is NOT associated with clinical stage four of HIV and AIDS?
  - Kaposi's sarcoma
  - HIV encephalopathy
  - Oral hairy leukoplakia
  - Central nervous system toxoplasmosis
  - Extrapulmonary cryptococcosis including meningitis



7. Laboratory diagnosis of HIV I utilizes different protocols and techniques to detect and measure the following EXCEPT;
- Viral antigens
  - Viral nucleic acids
  - Viral particles and conformations
  - Antibodies raised against the virus
  - Indirect predictors of HIV infection such as CD4 counts
8. Diagnosis of HIV infection in babies born to HIV-infected mothers cannot be established by which one of the following tests?
- Viral culture tests
  - Detection of viral RNA
  - Detection of viral DNA
  - Conventional antibody tests
  - Detection of the IgA class of antibodies to HIV
9. Which one of the following order correctly matches the HIV replication process?
- Binding, fusion, reverse transcription, integration, transcription, assembly and budding
  - Fusion, reverse transcription, binding, integration, assembly and budding and transcription
  - Reverse transcription, fusion, binding, transcription, assembly, budding and integration
  - Integration, transcription, assembly, binding, fusion, reverse transcription and budding
  - Transcription, assembly, reverse transcription, integration, binding, fusion, and budding
10. When does one interpret western blot results as 'indeterminate'?
- When there are no bands
  - When there is reactivity to g120/160
  - When there is reactivity to gp41 and p24
  - Presence of few bands that meet the criteria for a positive result
  - Presence of many bands that do not meet the criteria for a positive result
11. Primary prophylaxis is BEST described as
- Drugs given to reduce viral load.
  - Measures that are used to prevent an opportunistic infection.
  - Measures used to eradicate HIV virus from the blood.
  - Measures used by HIV-infected individuals to prevent transmission of HIV.
  - Method of hand washing to prevent spread of infection.
12. What according to World Health Organization (WHO) disease clinical stage system for HIV infection listed below is most likely associated with Oral candidiasis?
- I
  - II
  - III
  - IV
  - V
13. Effectiveness of antiretroviral therapy (ARV) regimen is BEST measured by:
- A fall in the plasma viral load.
  - A rise in red blood cell count and hemoglobin level.
  - A reduction in opportunistic infections.
  - A rise in plasma HIV antibodies level.
  - A rise in the CD4 count.

14. Standard serologic assays for HIV infection are usually associated with false negative results. This could be due to the following reason:
- A. Autoantibodies.
  - B. Influenza vaccination.
  - C. A test done during the "window period".
  - D. Undetectable viral load.
  - E. HIV vaccines.
15. Which statement about initiating drug Antiretroviral Therapy (ART) in World Health Organization (WHO) disease clinical stage 4 is TRUE?
- A. Treat if CD4 count is normal.
  - B. Treat if the CD4 count is lower than normal.
  - C. Treat if the CD4 count is higher than normal.
  - D. Treat irrespective of the CD4 count.
  - E. Do not treat until CD4 count is available
16. Giardiasis, an opportunistic infection in AIDS patients, is a:
- A. Bacterial infection.
  - B. Viral infection.
  - C. Parasitic infection.
  - D. Fungal infection
  - E. All choices are incorrect.
17. What is the most frequent cause of death in people infected with HIV in Africa?
- A. *Toxoplasma gondii* encephalitis
  - B. Pneumocystis pneumonia.
  - C. Tuberculosis.
  - D. Herpes simplex virus.
  - E. Invasive fungal disease.
18. You are reviewing laboratory results for a 50-year-old man. This man started on an antiretroviral regimen of efavirenz/tenofovir/emtricitabine six months ago. At baseline his CD4+ count was 150 cells/mm<sup>3</sup> and his HIV viral load was 77,000 copies/mL. He reports generally doing well on the initial regimen, but at 2 weeks he reported side effects of insomnia and agitation. At 8 weeks, his CD4+ count was 195 cells/mm<sup>3</sup> and viral load was, 50 copies/mL. Then, at 4 months, his CD4+ count was 250 and viral load was 692 copies/mL. Given the above information, which of the following is the most likely explanation for the patient's viral load increase?
19. The role of Reverse transcriptase is BEST described for the synthesis of:
- A. DNA from genomic DNA.
  - B. DNA from genomic RNA.
  - C. Messenger RNA (mRNA) from Host DNA.
  - D. DNA from Host RNA.
  - E. RNA from genomic RNA.

20. You are reviewing laboratory results for a 50-year-old man. This man started on an antiretroviral regimen of efavirenz/tenofovir/emtricitabine six months ago. At baseline his CD4+ count was 150 cells/mm<sup>3</sup> and his HIV viral load was 77,000 copies/mL. He reports generally doing well on the initial regimen, but at 2 weeks he reported side effects of insomnia and agitation. At 8 weeks, his CD4+ count was 195 cells/mm<sup>3</sup> and viral load was, 50 copies/mL. Then, at 4 months, his CD4+ count was 250 and viral load was 692 copies/mL. Given the above information, which of the following is the most likely explanation for the patient's viral load increase?
- Drug interactions
  - Drug adherence issues.
  - Drug potency.
  - Drug resistance.
  - Drug malabsorption.
21. Given the above information, which of the following laboratory tests is MOST appropriate to check next in the patient described in Question 19?
- Another CD4+ cell count.
  - Genotype test.
  - Order for another viral load test.
  - Liver function tests (LFTs).
  - Phenotype test.
22. The following are ways in which culture is critical in the prevention of the spread of HIV & AIDS. Which one is not?
- Taking or not taking risk of contracting HIV
  - Accessing treatment and care
  - Shaping gender relations and roles that put women and men at risk of infection
  - In determining spending patterns and therefore individual lifestyles
  - Being supporting towards or discriminating against people living with HIV/AIDS and their families.
22. According to the Mexico Declaration of 1982, culture includes all but one of the following:
- Ways of life
  - Science and Technology
  - Representations of health and disease
  - Traditions and beliefs
  - Family structures
23. It can safely be assumed that there exist contradictions/differences between the African 'map of universe' and western Christianity value systems. The relevant areas of these differences studied by Breetvelt include:
- Masculinity, Gender and Ancestor
  - Sin, Evil and Sexuality
  - Culture, traditions and religion
  - Education, Religion and Culture
  - Ancestry, culture and traditions
24. The joint UNESCO/UNAIDS approach to HIV/AIDS prevention and care was launched in?
- 1996
  - 2005
  - 1999
  - 1998
  - 2007



25. Below are some effects of HIV & AIDS on the health sector in Africa. Which one is not?
- A. Patients are admitted only in the later stages of the illness
  - B. Half of those admitted in hospitals suffer from HIV & AIDS related illnesses.
  - C. Excessive workloads, poor pay and migration to richer countries contribute to shortage of health care professionals
  - D. HIV positive patients stay in hospital four times longer than other patients.
  - E. Large number of health care professionals are directly affected by the epidemic.
26. Below are some reasons why school enrolment and HIV & AIDS have a reciprocal relationship. Which combination of reasons best explains this situation.
- i. Households of adults with high CG4 counts resemble those of HIV +ve in their ability to send their children to school.
  - ii. Education is one of the most effective and cost-effective means of preventing HIV infections.
  - iii. Children may be removed from school to care for the sick.
  - iv. Children are unable to afford fees and other educational expenses.
  - v. Young people without education are twice as likely to contract HIV as those who have completed primary school.
- A. ii, iii, iv
  - B. iii, iv, v
  - C. iv, v, i,
  - D. i, ii, v
  - E. i, ii, iii.
27. Which of the following cultural practices is most likely to lead to the spread of HIV/AIDS?
- A. Wrestling
  - B. Wife-inheritance
  - C. Tattooing
  - D. Removal of teeth
  - E. Cattle rustling
28. Which of the following is not a direct impact of HIV/ AIDS on the health of households:
- A. Reduced ability of care-givers to work
  - B. Rise in medical expenses
  - C. Reduced food production
  - D. Rise in the number of dependants
  - E. Loss of income
29. For effective Information, Education and Communication (IEC) it's important to carefully select materials for your campaign. Sufficient exposure to these materials will reinforce the following, except?
- A. Counseling and testing
  - B. Women's and human rights
  - C. Pro-cultural stigma messages
  - D. HIV prevention
  - E. Basic facts about HIV and Sexually transmitted Infections (STI)
30. Good Communication involves many factors for example understanding how people relate to each other. One of the following combinations of points relates purely to "information giving" as opposed to "information sharing" Which one is it?
- A. Participatory learning/ Formal teaching
  - B. Using many forms of visual media/ Depends on posters
  - C. Depends on lectures and talks/ Professional demonstrate knowhow
  - D. Telling learners what they should do/ Making idea attractive
  - E. Partnership/ Encourage dialogue

SECTION B: SAQs: Answer all questions (25 Marks)

*Part 1: Mark as true (T) or false (F) at the end of each question* (5 Marks)**NB: Each correct answer will earn you ½ mark**

1. Plasma viral load is the strongest predictor of HIV sexual transmission \_\_\_\_\_
2. Negative ELISA and western blot test results do not rule out HIV infection \_\_\_\_\_
3. The window period is the time between HIV infection and development of AIDS \_\_\_\_\_
4. Sexual contact between male and female accounts for >90% of HIV transmissions in Kenya \_\_\_\_\_
5. Male circumcision decreases the risk of female-to-male sexual transmission of HIV by 50% to 60%. \_\_\_\_\_
6. The number of B cells serve as an indicator of the status of the immune system as a function of advanced AIDS infection \_\_\_\_\_
7. After a retrovirus enters the host cell, the virus's own reverse transcriptase uses the viral DNA as a template to make a double stranded DNA molecule \_\_\_\_\_
8. Diagnostic techniques that measure a fall in plasma viral load and increase in CD4+ count can be used to indicate the effectiveness of antiretroviral therapy \_\_\_\_\_
9. Recurrent respiratory tract infections such as sinusitis, bronchitis, otitis media and pharyngitis are associated with clinical stage three of HIV and AIDS \_\_\_\_\_
10. Transmission of HIV is facilitated in the presence of other infectious diseases, especially when they are not associated with ulcerative lesions of the genital mucosa. \_\_\_\_\_

*Part 2: Risk Level: Write the correct level of risk for each behavior at the end of the question.***NB: Each correct answer will earn you ½ mark** (4 Marks)Decide and indicate whether each of the behaviours or characteristics listed below is **high risk**, **low risk** or **no risk** for getting HIV.

1. Multiple mosquito bites \_\_\_\_\_
2. Any opportunity for exchange of body fluids \_\_\_\_\_
3. Breast feeding \_\_\_\_\_
4. Occupational exposure \_\_\_\_\_
5. Casual contact \_\_\_\_\_
6. Having sex under the influence of alcohol or drugs \_\_\_\_\_
7. Having fewer copies of a gene that helps to fight \_\_\_\_\_
8. Having another sexually transmitted disease (STD), such as herpes, chlamydia, syphilis, or gonorrhoea \_\_\_\_\_

*Part 3: Cross Matching. Match the items in List A with the statements in List B***INSTRUCTIONS**

- i. This section consists of two Lists of items (List A and B).
- ii. The items in List A (item option) match with specific items in List B (Statement).
- iii. Identify item in List A that correctly matches with a particular statement in List B and enter the answer in List C. **See example below**
- iv. Each option can be used once only.



**Example:**

LIST A		LIST B		LIST C (ANSWER)
A	PHT112	i.	Platform for offering e-based courses	B
B	eCampus	ii.	Accessible anytime anywhere	C
C	Online module	iii.	Mandatory for all undergraduate students	A

11. Match the items in List A to those in List B (Each option can be used once only)

LIST A		LIST B		LIST C (ANSWER)
A	P24 antigen	i.	HIV-related neurological complication (G)	
B	Thrush	ii.	Effectiveness of antiretroviral therapy (ART)	
C	A fall in the plasma viral load and an increase in the CD4 count.	iii.	Associated with greatest degree of immunosuppression	
D	Acute HIV infection	iv.	An immune marker in the window period of HIV infection	
E	Primary prophylaxis	v.	Associated with process where information on RNA is transcribed into DNA in the host cell	
F	gp120 and gp41	vi.	Burst HIV replication with a decline in CD4 cell count	
G	Toxoplasmosis	vii.	Associated with primary infection with HIV	
H	Cryptococcal meningitis	viii.	These proteins bind to CD4+ cell receptors	
I	P17 antigen	ix.	A confirmatory diagnostic testing is necessary	
J	Retrovirus	x.	Medicines to prevent opportunistic infection	
K	Viral transmission			
L	Influenza like signs and symptoms			
M	Lentivirus			

12. Match the items in List A to those in List B (Each option can be used once only)

	LIST A		LIST B	LIST C (ANSWER)
A	Negative ELISA test result	i.	Resolve indeterminate results and diagnosis of HIV	
B	Blood transfusion	ii.	Associated with pre-test and post counseling	
C	Guideline for HIV Testing	iii.	Does not necessarily mean that the patient is infected with HIV	
D	Western blot	iv.	Does not rule out HIV infection	
E	Asymptomatic patient	v.	HIV and AIDS epidemiological surveillance	
F	Positive ELISA test result	vi.	Mandatory testing	
G	Anonymous HIV test			



**SECTION C: Case presentations: Answer all the questions (15 Marks)**

Each correct answer will earn you (1 mark)

**NB:** Enter the correct answer in the space provided at the end of each question

1. The origin of AIDS and HIV has been a contentious debate ever since the illness first came into being in the early 1980s. For the past two decades it has been the subject of spirited dispute and the cause of countless opinions, with everything from a philandering flight attendant to a questionable vaccine programme being accused. In an effort to clarify the development of HIV, a symposium was held in Addis Ababa, Ethiopia in November 1997, where internationally legendary Virologists investigating on HIV and AIDS were in attendance. At the end of the symposium, the following conclusions emerged and were circulated:

- Conclusion 1:** That HIV literally means 'slow virus' because they take such a long time to produce any adverse effects in the body.
- Conclusion 2:** That HIV is an infectious disease that may be transmitted from other animals, both wild and domestic, to humans
- Conclusion 3:** That HIV was transferred to humans as a result of chimps being killed and eaten or their blood getting into cuts or wounds on the hunter.
- Conclusion 4:** That HIV spread because one single syringe would have been used to inject multiple patients without any sterilization in between.
- Conclusion 5:** That many of the labourers would have been inoculated with unsterile needles against diseases such as smallpox (to keep them alive and working), and that many of the camps actively employed prostitutes to keep the workers happy, creating numerous possibilities for onward transmission.
- Conclusion 6:** That HIV was manufactured as part of a biological warfare programme, designed to wipe out large numbers of black and homosexual people.

**NB:** Use the above case scenario to answer the questions below

- a) Identify the Virus described in conclusion 1 \_\_\_\_\_ (1 Mark)
- b) Identify the theory described in conclusion 4 \_\_\_\_\_ (1 Mark)
- c) Identify the theory summarized in conclusion 6 \_\_\_\_\_ (1 Mark)
- d) Identify the theory described in conclusion 5 \_\_\_\_\_ (1 Mark)
- e) Name the theory summarized in conclusion 3 \_\_\_\_\_ (1 Mark)

2. During blood donation, five donors were found to be HIV positive. Donor A underwent cell count to decide whether or not to start taking antiretrovirals. Donor B was suffering from a protozoan opportunistic infection whose definitive host is the cat. Donor C had red, raised, tender vesicles or lesions on the vulva, in the vagina, on the cervix and anal area with multiple vesicles. Donor D had a sudden and rapid viraemia clinically, the patient presented with marked weight loss, chronic diarrhoea, and fever that had lasted for more than 1 month. Donor E was infected by yeast like fungus *Cryptococcus neoformans*, had severe headache that lasted over weeks, fever and neck stiffness that were often absent in early stages

**NB:** Use the above case scenario to answer the questions below

- a) Identify the opportunistic infection of Donor A? \_\_\_\_\_ (1 Mark)
- b) Name the cells that were counted in Donor B? \_\_\_\_\_ (1 Mark)
- c) Identify the HIV and AIDS stage of Donor C? \_\_\_\_\_ (1 Mark)

- d) Identify the opportunistic infection of Donor D? \_\_\_\_\_ (1 Mark)
- e) Identify the opportunistic infection of Donor E? \_\_\_\_\_ (1 Mark)

3. A night stripper was walking to her residence in Kayole at 3.00 AM where a group of three masked street urchins' exploited the prevailing blackout and defiled her. The next morning, she went to Jipange Dispensary in Obunga where she was given treatment to lessen her risk of contracting HIV infection. After three months had elapsed, she went back to the same health facility to conduct HIV test. She was taken through two counseling sessions, the first one before the test and the second one after the test. During testing, the counselor used two different types of HIV rapid diagnostic kits namely S and T. Rapid Test S was reactive and test T non-reactive, which compelled the counselor to use the third rapid diagnostic kit U to determine her true HIV status. On her way out, she met her sister night stripper who told her she was diagnosed to be HIV positive five years ago. The sister stripper had frequent attacks of infection K and J that took advantage of her failing immune system. Infection K was a systemic disease that presented with cutaneous lesions on the skin while infection J manifested in form of red, raised, tender vesicles or lesions which occurred on the vulva and in the vagina. The sister stripper was in the clinic to collect her monthly drugs.

**NB:** Use the above case scenario to answer the questions below

- a) What is the name of treatment she was given to reduce her chances of contracting HIV infection? (1 Mark)
- b) What is the name of the second counseling session? (1 Mark)
- c) Suggest the WHO clinical stage of sister stripper (1 Mark)
- d) What kind of drugs sister stripper gone to collect? Antiretroviral drugs/therapy? (1 Mark)
- e) What is the likely name of infection J genital herpes? (1 Mark)