



KENYATTA UNIVERSITY
DEPARTMENT OF MEDICAL MICROBIOLOGY AND PARASITOLOGY
HPA 200: PATHOLOGY I JOINT CAT
Date 28th NOVEMBER, 2022 **Time 9.00 AM - 12.00PM**

INSTRUCTIONS:

1. This paper is composed of 17 questions.
2. Answer all of questions.

SECTION A

1. State any five integral proteins on the human cell plasma membrane with a functional role in the induction and expression of an immune response (5 mks)
2. State the five mechanisms through which cell mediated immunity operates (5 mks)
3. Outline any five biological roles of antibodies in the human body defense and identification of pathogens (5 mks)
4. Explain tolerance induction in B and T cells (5 mks)
5. Outline three characteristics and two functions of mature dendritic cells (5 mks)
6. State five ways by which anaemia due to hookworm infection occurs (5 mks)
7. Match the parasite with the main pathological outcome associated with it (5 mks)

Pathology	Parasite
Billiary occlusion	<i>Trichiuris trichiura</i>
Loefflers syndrome	<i>Larvae of Ascaris lumbricoides</i>
Rectal prolapse	<i>Ancylostoma duodenale</i>
Pruritis ani	<i>Enterobius vermicularis</i>
Lymphatic occlusion	<i>Adult Ascaris lumbricoides</i>
	<i>Necator americanus</i>
	<i>Strongyloides stercoralis</i>
	<i>Wuchereria bancrofti</i>

8. A bilaterally symmetrical pear shaped organism was isolated from a 18-year-old female patient. On microscopic examination, the organism was found to have several flagella, an undulating membrane and a nucleus. No cystic forms were isolated.
- Identify the most likely parasite (1 mk)
 - Name two specimens that were likely collected from the patient (1 mk)
 - State the most obvious clinical picture associated with the organism (1 mk)
 - State two possible modes of transmission (1 mk)
 - Give effective treatment for the condition (1 mk)
9. With an example in each case, state five ways by which protozoans gain entry into the host (5 mks)
10. Select the parasitic stage from set B that best suits the description in set A. Each parasite stage can only be used once (5 mks)

Description (A)	Parasitic stage (B)
i. Infective form in <i>Plasmodia</i> species	a. Gametozoites
ii. Found in polymorphonuclear cells during an infection	a. Tachyzoites
iii. Causes disease relapse	b. Promastigotes
iv. Found in cat faeces	c. Hypnozoites
v. Transplacentally transmitted	d. Sporozoites
	e. Amastigotes
	f. Trypomastigotes
	g. Bradyzoites
	h. Merozoites

11. With the aid of a diagram, outline the replication steps of Adenovirus starting with the binding of a pre terminal protein (pTP) to the generation of a new viral genome (5 mks)
12. State five differences between the positive and negative sense single strand RNA viruses (5 mks)

13. A 5-year-old boy presents to the emergency room with diarrhea and abdominal pain. His mother reports that he has been having watery diarrhea for the past 2 days with some nonbloody vomiting. To study the nature and life cycle of this virus, you decide to isolate and grow the virus in primary monkey kidney cell culture.
- (a) State the possible virus that caused this condition and nature of genome (1 mk)
 - (b) Use a one-step growth curve to illustrate the viral load from the time of inoculation to the plateau phase of the infected cell culture. Label the X and Y axis, and the events at each time point (4 mks)
14. State five differences between exotoxins and endotoxins (5 mks)
15. Giving appropriate examples in each case, state five bacterial immune evasion mechanisms (5 mks)
16. With a labelled light path diagram, explain the working principle of a dark field microscope (5 mks)

SECTION B

17. Describe cellular adaptive processes (20 mks)