



KENYATTA UNIVERSITY
EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN MEDICAL
LABORATORY SCIENCE
HML 219: MEDICAL PROTOZOOLOGY

2ND SEMESTER 2022/2023

TIME: 2 Hours

INSTRUCTIONS:

SECTION A: ANSWER ALL QUESTIONS (4 MARKS EACH)

- 1a. Distinguish encystment from excystation (1 mark)
- 1b. List THREE general characteristics of intestinal *amoeba* (3 marks)
2. Outline the life cycle of *Balantidium coli*. (4 marks)
3. Describe the laboratory diagnosis of *Trichomonas vaginalis*. (4 marks)
4. List FOUR methods that can be used in the laboratory diagnosis of cutaneous and mucocutaneous leishmaniasis. (4 marks)
5. Outline FOUR genetic factors that have been shown to protect against malaria infections. (4 marks)

SECTION B: ANSWER ANY ONE QUESTION (20 MARKS EACH)

- 6a. Describe the lifecycle of *Cryptosporidium parvum*. (10 Marks)
- 6b. Discuss the pathogenesis of human African trypanosomiasis. (10 marks)
- 7a. Outline the life cycle of the malaria parasite. (10 marks)
- 7b. Describe the pathogenesis of toxoplasmosis. (10 marks)

SECTION C: ANSWER ALL QUESTION BY INDICATING THE RIGHT CHOICE ON THE ANSWER BOOKLET. EACH QUESTION IS 1/2 MARK.

1. Parasitic organisms that are most often transmitted sexually include:

A. *Entamoeba gingivalis*

B. *Dientamoeba fragilis*

C. *Trichomonas vaginalis*

D. *Diphyllobothrium latum*

2. The *incorrect* match between the organism and one method of acquiring the infection is

A. *Trypanosoma brucei rhodesiense*—bite of sand fleas

B. *Giardia lamblia*—ingestion of water contaminated with cysts

C. Hookworm—skin penetration of larvae from soil

D. *Toxoplasma gondii*—ingestion of raw or rare meats

3. Upon examination of stool material for *Cystoisospora belli*, one would expect to see:

A. Cysts containing sporozoites

B. Precysts containing chromatoidal bars

C. Oocysts that are modified acid-fast variable

D. Sporozoites that are hematoxylin positive

4. Which specimen is the least likely to provide recovery of *Trichomonas vaginalis*?

A. Urine

B. Urethral discharge

C. Vaginal discharge

D. Feces

5. An *Entamoeba histolytica* trophozoite has the following characteristics:

A. Central karyosome in the nucleus, ingested RBCs, and clear pseudopodia

B. Ingested RBCs, clear pseudopodia, and uneven chromatin on the nuclear membrane

C. Ingested RBCs, clear pseudopodia, and large glycogen vacuoles in cytoplasm

D. Large, blotlike karyosome, ingested white blood cells (WBCs), and granular pseudopods

6. *Toxoplasma gondii* is characterized by:

A. Possible congenital infection and ingestion of oocysts

B. Cosmopolitan distribution and possible difficulties with interpretation of serological results

C. Neither A nor B

D. Both A and B

7. Oocysts of *Cryptosporidium* spp. can be detected in stool specimens using:

Modified Ziehl–Neelsen acid-fast stain

B. Gram stain

C. Methenamine silver stain

D. Trichrome stain

8. Massive hemolysis, blackwater fever, and central nervous system involvement are most common with:

A. *Plasmodium vivax*

B. *Plasmodium falciparum*

C. *Plasmodium ovale*

D. *Plasmodium malariae*

9. Organisms that should be considered in a nursery school outbreak of diarrhea include:

A. *Endolimax nana*, *Giardia lamblia*, and *Entamoeba coli*

B. *Giardia lamblia*, *Dientamoeba fragilis*, and *Cryptosporidium* spp.

C. *Cryptosporidium* spp., *Trichomonas vaginalis*, and *Entamoeba coli*

D. *Pentatrichomonas hominis*, *Dientamoeba fragilis*, and *Endolimax nana*

10. Organisms that should be considered in a waterborne outbreak of diarrheal disease include:

A. *Giardia lamblia* and *Cryptosporidium* spp.

B. *Endolimax nana* and *Entamoeba histolytica*

C. *Blastocystis hominis* and *Trichomonas vaginalis*

D. *Toxoplasma gondii* and *Schistosoma mansoni*

11. The microsporidia are protozoans (now classified with the fungi) that have been implicated in human disease primarily in:

A. Immunocompromised patients

B. Pediatric patients under the age of 5 years

C. Adult patients with congenital immunodeficiencies

D. Patients who have been traveling in the tropics

12. A 60-year-old Brazilian patient with cardiac irregularities and congestive heart failure suddenly dies. Examination of the myocardium revealed numerous amastigotes, an indication that the cause of death was most likely:

A. Leishmaniasis with *Leishmania donovani*

B. Leishmaniasis with *Leishmania braziliense*

- C. Trypanosomiasis with *Trypanosoma gambiense*
- D. Trypanosomiasis with *Trypanosoma cruzi*
13. When malaria smears are requested, what patient information should be obtained
- A. Diet, age, sex
- B. Age, antimalarial medication, sex
- C. Travel history, antimalarial medication, date of return from malaria endemic zone
- D. Fever patterns, travel history, diet
14. In an outbreak of diarrheal disease traced to a municipal water supply, the most likely causative agent is:
- A. *Cryptosporidium* spp.
- B. *Cystoisospora belli*
- C. *Entamoeba histolytica*
- D. *Dientamoeba fragilis*
15. *Plasmodium vivax* and *Plasmodium ovale* are similar because they:
- A. Exhibit Schuffner's dots and have a true relapse in the life cycle
- B. Have no malarial pigment and multiple rings
- C. Commonly have applique forms in the red cells
- D. Have true stippling, do not have a relapse stage, and infect old red cells
16. Microsporidia have been identified as causing severe diarrhea, disseminated disease in other body sites, and ocular infections. Routes of infection have been identified as:
- A. Ingestion
- B. Inhalation
- C. Direct contamination from the environment
- D. Ingestion, inhalation, and direct contamination
17. Early ring stages of the fifth human malaria, *Plasmodium knowlesi*, resemble those of:
- A. *Plasmodium malariae*
- B. *Plasmodium ovale*
- C. *Plasmodium falciparum*
- D. *Plasmodium vivax*
18. Older developing stages (trophs, schizonts) of the fifth human malaria, *Plasmodium knowlesi*, resemble those of:

Plasmodium malariae

B. *Plasmodium ovale*

C. *Plasmodium falciparum*

D. *Plasmodium vivax*

19. Key characteristics of infection with *Plasmodium knowlesi* include:

A. Rapid erythrocytic cycle (24 hr), will infect all ages of RBCs, and can cause serious disease

B. Erythrocytic cycle limited to young RBCs and causes a relatively benign disease

C. The possibility of a true relapse from the liver, infection in older RBCs, and causes serious disease

D. Extended life cycle (72 hr), will infect all ages of RBCs, and disease is similar to that caused by *P. ovale*

20. Examination of a modified acid-fast stained fecal smear reveals round structures measuring approximately 8–10 μm , some of which are stained and some of which are not. They do not appear to show any internal morphology. The patient is symptomatic with diarrhea, and the cause may be:

A. *Blastocystis hominis*

B. Polymorphonuclear leukocytes

C. *Cyclospora cayentanensis*

D. Large yeast cells