



(University of Choice)

**MASINDE MULIRO UNIVERSITY OF
SCIENCE AND TECHNOLOGY
(MMUST)**

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR

**SECOND YEAR END OF TERM ONE
EXAMINATIONS**

**FOR THE DEGREE
OF
BACHELOR OF MEDICINE AND BACHELOR OF
SURGERY**

COURSE CODE: MPS 306

**COURSE TITLE: MEDICAL MICROBIOLOGY AND
PARASITOLOGY II [MEDICAL PRTOZOLOGY]**

DATE: 19/04/2022

TIME: 8.00-11.00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER ALL QUESTIONS IN SECTIONS A, B & C.

TIME: 3 HOURS

SECTION A: MULTIPLE CHOICE QUESTIONS [30 MARK]

1. Which of the following diagnostic methods is **MOST SUITABLE** for examining large volumes of stool rapidly in epidemiological surveys of intestinal protozoan infections?
 - A. Stool concentration method.
 - B. Modified Ziehl Neelsen method.
 - C. Eosin stool staining method.
 - D. Iodine stool staining method.
2. Aetiological agent of amoebic keratitis is?
 - A. *Acanthamoeba spp.*
 - B. *Balamuthia mandrillaris.*
 - C. *Naegleria fowleri*
 - D. *Sarcocystis homini*
3. Which of the following key pieces of information may be extracted from the portion of a parasite's life cycle that occurs outside the human body?
 - A. Parasitic disease symptoms and disease processes
 - B. Epidemiology and prevention and control measures.
 - C. Appropriate parasite diagnosis methodologies.
 - D. Selection of appropriate antiparasitic medication.
4. The infective stage of human *Plasmodium* spp to the definitive host is?
 - A. Merozoite
 - B. Oocyst
 - C. Sporozoite
 - D. Gametocyte.
5. Black water fever in malaria patients is characterized by which of the following?
 - A. Marked hemoglobinuria.
 - B. Kidney involvement in *P. falciparum* infections.
 - C. Caused by *P. falciparum*-induced red blood cell destruction.
 - D. All of the above.
6. An emerging human tick-borne protozoal disease more severe in splenectomized and immunocompromised patients and often transmitted and occur as coinfection with Lyme disease and/or human anaplasmosis is?
 - A. Babesiosis.
 - B. Tertian malaria.
 - C. Cryptosporidiosis
 - D. Cerebral malaria.
7. The life cycle of *Balantidium coli* and clinical symptoms are similar to that of?
 - A. *Cystoisospora belli*
 - B. *Entamoeba histolytica*

- C. *Cryptosporidium parvum*
D. *Giardia intestinalis/lambliia*.
8. How do humans become infected with *Sarcocystis hominis*?
 - A. Ingestion of uncooked or undercooked beef or pork containing tissue cysts.
 - B. Inhalation of oocysts during coughing.
 - C. Ingestion of animal fecal contaminated food containing oocysts.
 - D. A and C.
 9. Which of the following is **NOT** a characteristic of the trypomastigote stage in trypanosomes?
 - A. leaf-like (spindle shaped) tapering at both ends.
 - B. Actively motile when examined in fresh blood preparation.
 - C. Has a nucleus in the centre, kinetoplast, and flagellum attached to the body by an undulating membrane.
 - D. Has nucleus in centre close to kinetoplast and free flagellum.
 10. Which of the following is/are major challenge(s) in control and prevention of Chagas disease?
 - A. Large number of animal reservoirs makes it impossible to eliminate all sources of infection.
 - B. Few drugs are available for large-scale use in reducing the chances of transmission.
 - C. Currently there is no viable vaccine to protect susceptible individuals and animals.
 - D. All the above.
 11. Ameboma is a complication of amebic colitis in amoebic chronic infections:
 - A. It presents as a growth / mass of granulation tissue with peripheral fibrosis and inflammation.
 - B. It may lead to obstruction and low gastrointestinal bleeding.
 - C. It occurs mostly at the ascending colon and the cecum.
 - D. It leads to disseminated /extra-intestinal amoebiasis.
 12. Nasal irrigation using contaminated water and or swimming/diving in contaminated waters (rivers, lakes, pools) can lead to which infection?
 - A. Primary amoebic meningoencephalitis (PAM).
 - B. Chronic meningitis
 - C. Amoebic dysentery.
 - D. Acute meningitis.
 13. Which of the statement(s) is/are true with regard to sporozoans?
 - A. are intracellular protozoan parasites.
 - B. are extracellular protozoan parasites.
 - C. usually transmitted by vectors (mosquitoes, ticks etc).
 - D. all the above.
 14. One of the following wet mounts/preparation is best for protozoan cyst detection in fecal specimen. Which one is it?
 - A. Direct saline preparation.

- B. Eosin preparation.
 - C. Iodine preparation.
 - D. B and C.
15. The parasite has two developmental stages, the amastigote and promastigote, in its life cycle. Which parasite is it?
- A. *Trypanosoma cruzi*.
 - B. *Leishmania donovani donovani*.
 - C. *Trichomonas vaginalis*
 - D. *Trypanosoma brucei rhodesiense*.
16. The following are trypanocides **EXCEPT** which one?
- A. Nifurtimox.
 - B. Eflornithine.
 - C. Melarsoprol.
 - D. Tinindazole.
17. The protozoan parasite has oval/round cysts with four nuclei when mature.
- A. *Entamoeba coli*.
 - B. *Entamoeba histolytica*.
 - C. *Giardia lamblia*.
 - D. *Balantidium coli*
18. The main pathogenic mechanism in cerebral malaria is:
- A. Infected RBC cytoadherence and blockage of blood flow to brain.
 - B. Hypnozoites block blood flow to brain.
 - C. Immunological reactions leading to inflammation of brain membranes.
 - D. All the above.
19. Which of the following pairs of protozoa are **NOT** kinetoplastid flagellates?
- A. *Giardia intestinalis* and *Trichomonas vaginalis*.
 - B. *Cyclospora cayatenensis* and *Enterocytozoon bieneusi*
 - C. *Balantidium coli* and *Cystoisospora belli*.
 - D. All the above.
20. Hypnozoites in *Plasmodium* species life cycle are responsible for?
- A. Malaria relapses.
 - B. *Plasmodium* drug resistance.
 - C. Malaria recrudescence.
 - D. All the above.
21. Identify sample specimen of choice for coccidian oocysts and pseudocysts respectively.
- A. Sputum, urine.
 - B. Liver aspirates, blood.
 - C. Faeces, tissues/biopsy.
 - D. Skin snip, aspiration of lymph fluid.
22. The following protozoans can be transmitted through organ transplantation/blood transfusion **EXCEPT**?

- A. *Leishmania donovani donovani*.
 - B. Chagas disease.
 - C. *Trichomonas vaginalis*.
 - D. *Trypanosoma brucei gambiense*
23. Which of the following protozoan parasites have an indirect life cycle:
- A. *Cyclospora cayatenensis*
 - B. *Enterocytozoon bieneusi*
 - C. *Sarcocystis hominis*
 - D. None of above.
24. One of the following infections /diseases is **NOT** a zoonosis. Which one is it?
- A. Trypanosomiases
 - B. Toxoplasmosis
 - C. Trichomoniasis
 - D. Malaria caused by *Plasmodium knowlesi*.
25. Transmission of *Trypanosma cruzi* is an exapmle of:
- A. Cyclical and contaminative transmission.
 - B. Mechanical and contaminative transmission.
 - C. Cyclical and mechnaical transmission.
 - D. All the above.

For questions 26 – 30 Answer TRUE or FALSE.

26. Flagellates in the following genera: *Trypanosoma*, *Leishmania*, *Giardia*, *Trichomonas* possess a single flagellum. **TRUE or FALSE.**
27. Microsporidians are obligate extracellular protozoans that infect man via ingestion of oocyst containing polar tube also known as polar filament. **TRUE or FALSE.**
28. Apicomplexans are characterized by apical complex, complex life cycles involving sexual and asexual reproduction and several developmental stages with flagella, cilia, or pseudopods. **TRUE or FALSE.**
29. Trypomastigotes of *Trypanosoma brucei rhodesiense* and *Trypanosoma cruzi* can be distinguished by their morhological features under microscope. **TRUE or FALSE.**
30. Complications of human babesiosis commonly associated with severe illness include: acute respiratory failure, congestive heart failure, liver and renal failure. **TRUE or FALSE.**

SECTION B: SHORT ANSWER QUESTIONS [40 MARKS]

31. Distinguish between laboratory and clinical diagnosis and state the advantages and limitations of each. **(5 marks)**.
32. Describe a suitable diagnostic technique for extra-intestinal amoebiasis **(5 marks)**.
33. Describe the life cycle of *Toxoplasma gondii* in human host **(5 marks)**.
34. Describe the clinical presentation of:
 - i. African human trypanosomiasis
 - ii. American human trypanosomiasis **(5 marks)**.
35. Describe events that occur during the exoerythrocytic and erythrocytic phases of *Plasmodium falciparum* life cycle **(5 marks)**.
36. Name **ONE** antiprotozoal drug used in treating the following infections:
 - i. Trichomoniasis
 - ii. Cryptosporidiosis
 - iii. Chagas disease
 - iv. Cerebral malaria
 - v. Kal azar **(5 marks)**.
37. Citing specific examples explain the medical/public health importance of “Free-living amoebae” **(5 marks)**.
38. Briefly explain pathogenic mechanisms of the following protozoan parasites:
 - i. *Balantidium coli*.
 - ii. *Trypanosoma brucei rhodesiense*.
 - iii. *Sarcocystis spp*
 - iv. *Microsporidia spp*
 - v. *Giardia lamblia*. **(5 marks)**.

SECTION C: LONG ANSWER QUESTIONS [30 MARKS]

39. Discuss human diseases caused by intracellular protozoa with reference to aetiology, transmission and clinical manifestations. **(15 marks)**.
40. Discuss intervention strategies you would undertake to control/prevent/manage an outbreak of named human disease(s) caused by kinetoplastid flagellated protozoa. **(15 marks)**.