



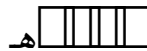
# Study Guide

## Medical Parasitology

**3<sup>RD</sup>. YEAR MEDICINE**

**ACADEMIC YEAR 2007 - 2008**

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بسم الله الرحمن الرحيم

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## I. STAFF LISTING

The following is a list of the faculty members and staff of the Department of Medical Parasitology.

Students are welcome to contact any of the members of the department to answer any of the inquiries.

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1. Dr. Faten Albrikan			
2. Dr. Hala S. Said			
3. Dr. Manal Jamjom			
4. Dr. Azza			
4. Mrs. Awatef Alsaqaf			

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1. Dr. Mohamed Al-Rohaily			
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## I I. COURSE OVERVIEW

### A. INTRODUCTION TO THE STUDY GUIDE :

This study guide has been prepared as a guide for 3<sup>rd</sup>. Year Medical students in the **Medical Parasitology** course. It is not intended to be a complete manual of Parasitology but a guide assist the students as they direct themselves throughout the course.

The purposes for this study guide :



1. To provide students with a clear description of the expectations, schedules and evaluation procedures for the course in **Medical Parasitology**.
2. It is the beginning of a data of information in Parasitology that students can take with themselves into their chosen discipline.
3. It is a communication device that the students can use as they talk with their teachers throughout their training period.

All three purposes listed above are intended to help the students become **independent, lifelong learners**. That is essential for them to become and continue to be **effective and efficient physicians**.

It is hoped the students will find their work in this department interesting, and the department would advise them to use this opportunity to learn as much as possible during their time in this department as it might be the main opportunity for them to be in close contact with this specialty.

### B. COURSE DESCRIPTION AND ORGANIZATION

The interest in **parasitic and vector-borne diseases** has recently increased tremendously not only in the **tropical and sub-tropical countries** but globally.

The fast means of travel, the interdependence of countries, mass migration from rural to urban and endemic to non-endemic areas or vice versa have all increased the opportunities of mutual contact between people of different nationalities, races and cultural groups. Some of the **communicable diseases** therefore have become more widespread particularly in the tropical and subtropical countries.

Some of the above mentioned factors are compounded in the unique situation presented in the **Kingdom of Saudi Arabia** which is vast **subtropical country** situated at the center of the Islamic World.

It receives each year some **two million** people from all parts of the world for **Haj** alone and several **hundred thousands** throughout the year for **Umrah**.

The majority of people, however, belong to tropical and subtropical countries where many **parasitic and vector-borne diseases are endemic**. In addition a large number of expatriates from different geographical areas of the world come and work here for various lengths of time.

Further many Saudis are traveling to endemic areas within the country and to other countries for business or vacations. They are all sharing in the pool of wide ranging parasitic and other diseases here and elsewhere.

The study of **Human Parasitology and Medical Entomology** in the Kingdom therefore should not be restricted only to endemic diseases (which of course should form the main content of studies) but must be broad based. It should include a reasonable amount of knowledge of the fundamental principles and factors which operate in the acquisition, establishment and the maintenance of different parasitic diseases.

Further the knowledge of the parasitic diseases prevalent in the neighboring countries and those likely to be brought in here from other countries deserve considerable attention.

An attempt has been made therefore to design the course of Human Parasitology and medical entomology to meet these diverse needs and conditions.

**The course given to medical students will emphasize several aspects of parasites comprising :**

1. **Geographical distribution.**
2. **Diagnostic morphology** of the causative organism both in its adult and developmental stages.
3. **Life cycle, including :**
  - the **mode** of infection ..
  - portal of **entry and exit** ..
  - the **habitat** ..
  - the **cycle in man** and in external environment and other vertebrate or invertebrate hosts ..
  - the **factors** (biological and environmental) that affect the cycle in its various phases ...
4. **Pathogenesis** of the disease and its relationship to the **clinical manifestations, and Pathology.**
5. **Diagnosis** with special stress on both the conventional and advanced techniques. The principles of the most commonly used immunodiagnostic techniques are also discussed.
6. **Treatment** with special stress on the most recent therapeutics.
7. **Prevention and control** with emphasis on the relevant aspects of the life cycle of the parasite.



Throughout the course efforts will be made to update the body of knowledge available on Parasitology :



- 1. Treatment:** the most recent medicaments will be mentioned with special emphasis on the **drug of choice** and other alternative drugs commonly in use.
- 2. Diagnosis:** apart from the conventional methods of diagnosis the new up-to-date techniques are given including **immuno-diagnosis**. Besides, the students are informed about other methods of investigations e.g. **computerized topography scan, ultrasonography, x-ray, radio immuno assays** etc... whenever indicated.

Special efforts will be made to stress the clinical aspects of parasitic diseases. In addition to the systematic teaching of Medical Parasitology there will be:



- a) Correlation of the biology of the parasite with the pathogenesis and clinical manifestations such as **anaemia, fever, dysentery, diarrhoea, jaundice, lymphadenopathy, abdominal swellings, surgical problems, lung, liver, and cerebral affections** etc. is explained.
- b) Emphasis on the impact of life cycle and bionomics of the parasite on the **epidemiology** of the relevant disease.
- c) Special attention will be paid to **opportunistic parasites** such as (e.g.) ***Toxoplasma, Pneumocystis, Nosema, free living amoebae, Strongioides*** and their relation to **compromised immunity, immunosuppressive drugs, debilitating diseases, malignant diseases** etc ...

As the course of **Medical Parasitology** is concerned with diseases affecting man hence a knowledge of Biochemistry, Anatomy , Physiology , Pharmacology and Pathology is an essential prerequisite to the understanding of host-parasite relationships, clinical manifestation, pathogenesis and treatment.

### III. COURSE OBJECTIVES

#### A. MAJOR COURSE OBJECTIVES.

The course in human parasitology and medical entomology is designed to make students fully aware of the practical significance of the biology of human parasites and the phenomenon of parasitism.

By the end of the course the students should be able to:


1. Understanding of the importance, epidemiology, biology, life-cycle, morphology, diagnosis, symptomatology, management and prevention of the common helminths and protozoa parasitic in humans found in tropical and sub-tropical areas.
2. Show an appreciation of how knowledge of the various aspects of each parasite could help in understanding the rational of causation, propagation and maintenance of each parasitic infection in man and his environment.
3. Describe the pathogenesis and clinical manifestations of parasitic diseases.
4. Demonstrate the knowledge and procedures needed to carry out accurate diagnosis of common parasitic disease of man.
5. Arrive at rational conclusions, undertake effective therapeutic measures and also give sound advice on preventive and or control measures.



## **Specific Educational Objectives :**


### **1. Introduction**

Students should:

- 
- 1.1. Understand the concept of parasitism.
  - 1.2. Know how the protozoa and helminthes are differentiated.
  - 1.3. Know the valid scientific names of all parasites of humans.
  - 1.4. Define a definitive host and intermediate host.
  - 1.5. Be aware of the criteria for classifying major arthropods of human importance.
  - 1.6. Be aware of sources of parasitic infections.
  - 1.7. Know the effect of the parasite on the host.
  - 1.8. Be aware of control and management of parasitic diseases.
  - 1.9. Be aware of different factors affecting epidemicity and endemicity of parasitic diseases.

### **2. Medical Protzology and Helminthology**


Students should:

- 
- 2.1. Understand the geographical distribution of the parasite in the world, as well as in Saudi Arabia.
  - 2.2. Be aware of Imported parasitic diseases.
  - 2.3. Understand the epidemiological aspects affecting transmission of the parasite.
  - 2.4. Be able to outline the life-cycle of the parasite, and relate it to :
    - Pathogenesis
    - Main clinical manifestations relating to the acute as well as chronic phase of the disease.
    - Complications.
  - 2.5. Understand the different methods used for parasite diagnosis including :
    - Direct Method ( Parasitological )
    - Indirect Methods.
    - Supportive Methods.
  - 2.6. Relating these diagnostic procedures to the Acute/chronic phases.
  - 2.7. Understand the different methods used for prevention and control.




## a2. Intestinal Protozoa

Students should be able to :

- 
- a2.1. Name the protozoa causing **diarrhoea** and/or **dysentery** in humans.
  - a2.2. Know the **underline mechanism** of diarrhoea and/or dysentery in humans due to protozoal infection.
  - a2.3. Know in detail the morphology, life cycle and epidemiology of *Entamoeba histolytica*, *Giardia lamblia*, and *Cryptosporidium parvum*.
  - a2.4. Discuss the **modes of transmission** of these parasites and how transmission can be prevented.
  - a2.5. Discuss the **parasitological diagnosis** of the intestinal protozoal infections.
  - a2.6. Know what **drugs** are used to treat these protozoa.

## b.2. Malaria

Students should be able to :

- 
- b2.1. Name the **four species** of human malarial parasites.
  - b2.2. Describe the **life cycle** of the four species of human malarial parasites, and how to **relate the life-cycle to Pathogenesis, clinical manifestations and complications**.
  - b2.3. Understand the basic **pathplogical changes** of the malarial parasite.
  - b2.4. Discuss the **clinical differentiation** of the four species of human malarial parasites.
  - b2.5. Distinguish between the four species of human malarial parasites seen in **thin blood smears**, describe the findings and recognise the three main stages of the parasite (trophozoite, schizont and gametocyte) seen in the **peripheral blood**.
  - b2.6. Know the methods of **malaria diagnosis**.
  - b2.7. Discuss the worldwide **epidemiology** and situation of malaria in **Saudi Arabia**.
  - b2.8. Describe the general **morphology and distribution of the mosquito vectors** of malaria and different methods used to control mosquito.

## c2. Leishmaniasis

Students should be able to :



- c2.1. Name the different species of human *leishmania* parasites (cutaneous, mucocutaneous and visceral Leishmaniasis) both in the Old World and the New World.
- c2.2. Describe the life cycle of *leishmania* species.
- c2.3. Understand the basic histopathology of *leishmania* parasite.
- c2.4. Discuss the clinical differentiation of the different species of human *leishmania* parasites.
- c2.5. Describe the general morphology and distribution of the sand fly vectors of *leishmania* species
- c2.6. Discuss the worldwide epidemiology and situation of **Leishmaniasis** in Saudi Arabia.
- c2.7. Know the methods of *leishmania* diagnosis.

## d2. Other Protozoa of Medical Importance

Students should be able to :



- d2.1. Describe the morphology, life cycle, diagnosis and epidemiology of *Toxoplasma gondii*.
- d2.2. Be aware of the clinical significance of infection with *T. gondii*. Discuss modes of transmission of *T. gondii* and how transmission can be prevented, and options for treatment.
- d2.3. Know the morphology, diagnosis and clinical significance of *Trichomonas vaginalis*.
- d2.4. Know the clinical significance of *Pneumocystis carinii*.

## e2. Cestodes

Students should be able to :



- e2.1. Describe the general morphology of **tapeworms**.
- e2.2. Describe the epidemiology, life cycle, and clinical manifestations *Taenia saginata*, *Taenia solium*, and *Echinococcus granulosus*.
- e2.3. Discuss **cysticercosis**.
- e2.4. Discuss the problem of **hydatid disease**, and its clinical significance

## f2. Faecal / Soil Transmitted Nematodes

Students should be able to :



- f2.1. Describe the morphology of the *Enterobius*, *Trichuris*, *Ascaris*, *Strongyloides*, and **hookworms** and how to distinguish between them.
- f2.2. Know the life cycles of these parasites.
- f2.3. Know what pathological effects these helminths have on the human host and its clinical manifestation.
- f2.4. Know how infections with these parasites are diagnosed.
- f2.5. Know how these parasites are transmitted and strategies for control.

## g2. Filariasis

Students should be able to :



- g2.1. Know the names of the different nematodes causing filariasis.
- g2.2. Know the life cycle of *Wuchereria bancrofti* and *Onchocercus volvuls*.
- g2.3. Know what pathological effects these helminths have on the human host and its clinical manifestation.
- g2.4. Discuss the different types of filariasis, their magnitude as a problem and their methods of diagnosis.

## h2.Trematodes



Students should be able to :

- h2.1. Describe the general morphology of trematodes.
- h2.2. Discuss the epidemiology, life cycle, and clinical significance of *Fasciola hepatica*, *hetrophys hetrophys*, *Paragonimus* spp, and *Clonorchis sinensis*.

## i2. Schistosomiasis



Students should be able to :

- i2.1. Name the three species of human *schistosoma* parasites.
- i2.2. Differentiate between the different species of human *schistosoma*.
- i2.3. Describe the life cycle of the three main species of human *schistosoma* parasites, and how to relate the life-cycle to pathogenesis, clinical manifestations and complications.
- i2.4. Understand the basic pathological changes in human.
- i2.5. Discuss the clinical differentiation of the three species of human *schistosoma* parasites.
- i2.6. Know the drugs used in the treatment of *schistosoma* infections.
- i2.7. Know how these parasites are transmitted and strategies for control.
- i2.8. Discuss the worldwide epidemiology and situation of Schistosomiasis in Saudi Arabia.

## 3. Arthropods of Medical importance


Students should:



- 3.1. Outline of vector life-cycle.
- 3.2. Understand the general concept of factors affecting transmission.
- 3.3. Understand the mechanism of transmission of disease.
- 3.4. Be aware of arthropods medical importance, including :
  - Diseases caused by vector.
  - Diseases transmitted by vector.
- 3.5. Understand the general concept for prevention and control.


### **a3. Parasitic Mites and Lice**

**Students should be able to :**

- 
- a3.1. Identify *Sarcoptes scabiei* and lice from other arthropods parasitic on humans.
  - a3.2. Know the life cycle and epidemiology of mites and lice.
  - a3.3. Know the medical importance of mites and lice.
  - a3.4. Know how infection is diagnosed.
  - a3.5. Know how these parasites are transmitted.
  - a3.6. Be aware how scabies and lice are treated.
  - a3.7. Be aware of the problem of acaricide resistance.
  - a3.8. Know strategies for control of these parasites.


### **b3. Mayiasis**

**Students should be able to :**

- 
- b.3.1. Identify the arthropods parasitic that causes mayiasis in humans.
  - b.3.2. Know the life cycle and epidemiology of these flies.
  - b.3.3. Know the different clinical “type” of mayiasis.
  - b.3.4. Know the clinical picture of this disease.
  - b.3.5. Know how infection is diagnosed.
  - b.3.6. Be aware how mayiasis is treated.
  - b.3.7. Know strategies for control of these parasites.

### **I. Zoonotic Parasites**

**Students should :**

- 
- i1. Be able to list the parasites that can be transmitted from animals to humans.
  - i2. Be aware of the situations in which transmission is more likely to occur.
  - i3. Be able to discuss the aetiology, presentation, investigation, management and control of zoonotic parasites.



Following is the current time  
(hours) allocation,  
by topic, for the course

Topics	Lectures	Practicals	Tutorial & PBL sessions <sup>(a)</sup>
Introduction	-	-	1
Cestodes	7	6	2
Nematodes	12	14	3
Trematodes	7	10	2
Protozoa	15	16	4
Medical Entomology	7	6	2
<b>TOTAL</b>	<b>48</b>	<b>52</b>	<b>14</b>

\* a. Problem based learning sessions

\* b. Tutorial/ week for 26 week.

## IV. LECTURE OUTLINE

### 1. TREMATODES



▪ Introduction	-
▪ <u>Liver flukes</u>	
✓ <i>Fasciola hepatica</i>	1
✓ <i>Clonorchis sinensis</i>	1
▪ <u>Intestinal flukes</u>	
✓ <i>Hetrophyes hetrophes*</i>	
▪ <u>Lung flukes</u>	
✓ <i>Paragonimus westermani</i>	1
▪ <u>Blood flukes</u>	
✓ <i>Schistosoma</i> spp.	4

TOTAL LECTURES = 7

### 2. CESTODES



▪ Introduction	1
▪ <u>Intestinal cestodes</u>	
✓ <i>Diphylobothorium latum</i>	1
✓ <i>Taenia</i> spp.	1
▪ <u>Tissue cestodes</u>	
✓ Cysticercosis	1
✓ <i>Echinococcus granulosis</i> (Hydatid)	2
✓ <i>Multiceps multiceps</i> + Coenurosis + Sparganosis	1

TOTAL LECTURES = 7

NB. *Hymenolepis nana* will be covered in TUTORIAL session.

### 3. NEMATODES



▪ Introduction	1
▪ <u>Intestinal nematodes</u>	
✓ <i>Ascaris lumbricoides</i>	1
✓ <i>Trichuris trichuria</i>	1
✓ <i>Entrobilus vermicularis</i>	1
✓ Hookworms + Cutaneous larval migrans	2
✓ <i>Strongyloides stercoralis</i>	1
▪ <u>Tissue nematodes</u>	
✓ <i>Toxocara</i> spp. (Visceral larval migrans)	1
✓ <i>Wuchereria bancrofti</i> + <i>Brugia malayi</i>	2
✓ <i>Drucunculus medinensis</i> (Medina worm)	1
✓ <i>Onchocerca volvolus</i>	1

**TOTAL LECTURES = 12**

NB. *Trichenella spiralis* and *Loa loa* will be covered in a TUTORIAL session.

### 4. PROTOZOA



▪ Introduction	
<u>Intestinal &amp; urogenital protozoa</u>	
✓ <i>Entamoeba histolytica</i> + Non-pathogenic <i>Amoeba</i>	2
✓ <i>Giardia lamblia</i>	1
✓ <i>Cryptosporicia</i> spp.	1
✓ <i>Trichomonas vaginalis</i>	1
▪ <u>Tissue protozoa</u>	
✓ <i>Toxoplasma gondii</i> + <i>Pneumocystis carinii</i>	2
✓ Malaria ( <i>plasmodium</i> spp.)	3
✓ Cutaneous and mucocutaneous leishmaniasis	1
✓ Visceral Leishmaniasis	2
✓ African and American Trypanosomiasis	1
✓ Free living <i>Amoeba</i>	1

**TOTAL LECTURES = 15**



## 5. ARTHROPODS



✓ Mosquitoes	1
✓ Sandflies + Blackflies	1
✓ <i>Musca</i> spp. + <i>Glossina</i> spp.	1
✓ Myiasis	1
✓ Fleas	1
✓ Lice + Bugs	1
✓ Ticks + Mites	1

**TOTAL LECTURES = 7**

## VI. RECOMMENDED BOOKS

### 1. TEST BOOK



- ✓ **Medical Parasitology** (1999; 8<sup>th</sup> edition). E. K. Markell; D. T. Jhon & W. A. Krotoski. Publisher. W. B. Saunders Compony.
  - ISBN 0-7216-7634-0
- ✓ **Basic Clinical Parasitology** (1994; 6<sup>th</sup> edition). Neva and Brown. Publisher. Prentice -Hall International Inc.

### 2. ALTERNATIVE (Supplementary) TEXT BOOKS



- ✓ **Mansons Tropical Diseases** (18<sup>th</sup> edition, 1996). Gordon Cook. Publisher; W.B. Saunders.
- ✓ **Strickland Hunters Tropical Medicine** (7<sup>th</sup> edition, 1996). G. T. Strickland Hunter, Publisher W. B. Saunders Compony.

*NB. Selected chapters concerning Parasitic diseases will be referred to by the concerned academic staff during the lecture, if and when the recommended text book is considered insufficient.*

### 3. Alternative book with emphasis to Diagnostic parasitology



- ✓ **Diagnostic Medical Parasitology** (3<sup>rd</sup> edition, 1988). L.S. Garcia & D.A.Bruckner. Publisher, Elsevier Science co. Inc.
  - *NB. Provides a good account of Direct and Indirect methods. Supplements your lecture notes and tutorial sessions.*
- ✓ **Atlas of Tropical Medicine and Parasitology** (4<sup>th</sup> edition, 1995). W.Peters and H.M. Gilles. Publisher; Mosby-Wolfe

*NB. Excellent Atlas provides a graphic presentation of the parasite, clinical manifestations, diagnosis, vector of transmission and step in their prevention and control.*



## VI. TUTORIALS GUIDELINES

- **STUDENTS ARE DIVIDED INTO GROUPS AS INDICATED IN 3<sup>rd</sup> YEAR TIME TABLE.**
  - a. Each group will be further sub-divided into sub-groups (each group does not exceed 20 students)
  - b. Each sub-group will be under the supervision of an academic staff.
  - c. Structure of the tutorials will be based upon the following :

1. Discussions of Topics pre-determined by the department as self independent learning (these topics will be included in the exams).
2. Discussions based upon examination type questions (questions and answers) as a method of training. These sessions will cover the following :
  - a. Relating the life cycle to pathogenesis & symptomatology
  - b. Give an out line of .....
  - c. Give an account of .....
  - d. Briefly discuss .....
  - e. Briefly out line the treatment and management .....
  - f. Compare between .....
  - g. Multiple choice questions (single answer)
  - h. Other styles that may arise during the course
3. Discussing explaining the main aspects for determining differential diagnosis of clinical cases, where the following facts are provided.
  - a. Geographical distribution; patient age and case history, clinical signs, Clinical manifestations and laboratory results.
  - b. an outline of early clinical signs (pathogomonic features) and reasons for his/her choice of differential diagnosis as confirmation.
  - c. Clinical cases will either be covered in tutorial sessions or in problem based learning sessions, if and when indicated in the 3<sup>rd</sup> year time table.



## VII. PRACTICAL SESSION GUIDELINES

### Introduction

The laboratory is designed to teach 3<sup>rd</sup> year medical students the basics of identification of common **protozoan** and **helminth** parasites of humans. It is also introduce you to some of the techniques that been used to detect the eggs, cysts, and larvae of parasites in the human samples.

### Lab objectives :

After completing this section, the student should be able to :

1. Differentiate the life stages, of protozoa (trophozoites and cysts), helminthes (adult, egg and larval stages), and arthropods of medical important.
2. Classify, identify, discuss the disease process and describe the life cycles of medically important parasites.
3. Understanding of the **main morphological** aspects of identification.
4. Correlate these observations with the following aspect:
  - a. Knowledge of infective and diagnostic stages.
  - b. Relating the life cycle to pathogenesis (with understanding of mechanisms)
  - c. Correlating the parasitic stages to the diagnostic procedures during the acute and chronic phases of the disease.
  - d. Correlating the parasitic stage, habitat, pathogenesis, to other supportive diagnostic methods to confirm the differential diagnosis reached.



## General practical guidelines



1. Each student is required to observe the parasitic stage microscopically, to familiarize his/her self with the main morphological features and draw a labeled diagram of his/her observations.
2. The examination of human samples, such as stool and blood for parasites is described in the lab book, although you will not be doing this procedure this year.
3. Since most of the diagnostic stages of parasites are microscopic, the proper use of your microscope is very important. Therefore, a section of this lab book covers the proper use of the microscope and gives some suggestions as to correcting some common problems.
4. Slide projection of the major parasitic diseases will be shown.
5. Discussions to correlate between the morphological features of identifications for each group of parasites or vectors will be undertaken, to provide a general overview, helping in the understanding of the practical aspects.

## Laboratory Note Book



- A practical note book will be provided to each student, indicating the essential morphological aspects of identification of parasite or vector of medical importance.
- This book should be maintained throughout the laboratory practical sessions and it contain details of all the work you have undertaken.
- **This book is must be brought with you in the laboratory at all times.** This is particularly important as your books may be inspected at any time without prior notice.
- It is your responsibility to ensure that your laboratory notebook is signed at the end of each session by the lecturer or demonstrator.
- The laboratory notebook will be assessed and **3%** of the marks awarded for presentation.
- Please note that only the notebook can be used during this test. Loose sheets and other material cannot be used.
- **Deadline** - The laboratory notebook will be assessed at the end of each semester.

## Practical examination guidelines

On an exam, students will not only be responsible for identification of specimens, but also for the content of the laboratory manual, as well as the life-cycles, sites of infection, intermediate hosts that may be utilized, basic morphology, and any associated pathology.

The following information is required for the practical examinations :

### A. PARASITES



1. Knowledge of the main morphological aspects of identifications
2. Infective and diagnostic stages
3. Main method of diagnosis
4. Material examined
5. Mode of infection
6. Type of tissue observed, if a pathological slides is provided.
7. Main drug of choice
8. Scientific name of parasite

### B. VECTORS



1. Main morphological features of identification.
2. Medical importance:
  - a. Diseases caused
  - b. Diseases transmitted
3. Infective stage to vector
4. Infective stage to man

## Objective Structured Practical Examination (OSPE)

- The time allocated for this exam is 3 hour
- *You may not leave before the end*
- If the exam start at 9:00 a.m. - *please be at the department at 8:30 a.m*
- There are 2 stations in this exam.



- **Station I.**
  - THEORY paper.
  - Test knowledge (clinical cases - 5 cases).
  - Time 60 min.
  - 25 % of the marks for the practical.
- **Station II.**
  - Spot identification (15 spots).
  - Test knowledge and skills.
  - Time 120 min.
  - 75 % of the marks for the practical.

- When you hear the bell you must move to the next station.
- As you leave each station, **place your answer for that station face downwards** in the box provided.
- For most stations you must write your answers in the spaces on the page for that question.
- If you need more space then continue on the reverse of the page for that question only.
- For **stations 2** you must transfer your answers to a computer-readable sheet. You must place subject code in the space indicated at the top of the sheet.
- Make sure that you use the correct **BOOK** for each station - they are labelled at the top as :
  - OSPE- station i,
  - OSPE- station ii
- You must place YOUR NAME & COMPUTER NO. in the space indicated at the top of each paper.



- The majority of the questions are of an MCQs type of questions.
- The relative **value** of each part question is shown.

- LOOK FOR YOUR NAME AND NO. AND GROUP at the department of medical Parasitology.
- FOLLOW THE TIME TABLE INDICATED FOR EACH GROUP.

## VIII. EVALUATION GUIDELINES

### 1. Mid – year

	Exam	Marks/100
1.	In course Assessment (1 <sup>st</sup> . Term)	5
2.	1 <sup>st</sup> . Term Practical examination (OSPE 1.)	10
3.	MID-YEAR Theory examination	25
Total		40

### 2. Final

	Exam	Marks/100
4.	In course Assessment (2 <sup>nd</sup> . Term)	7
5.	Laboratory Book	3
6.	2 <sup>nd</sup> . Term Practical examination (OSPE 2.)	10
7.	Final Theory examination	40
Total		60

**Total Marks (Mid year 40% + Final 60% = 100 )**

#### **NB. PRACTICAL EXAMINATION:**



- Cestodes + Nematodes + Trematodes will be examined at the end of the first term.
- Protozoa + Arthropodes will be examined at the end of second term.





## Examples of the practical Exam

### Question 1 :

The name of the vector that transmit this parasite is :

- Phlebotomus spp.
- Anophyles spp.
- Reduviidae.
- Glossina.
- Culex

### Question 2 :

The name of the parasite that cause this ulcer is :

- L. infantum*
- L. major*
- L. tropica*
- L. donovani*
- L. braziliansi*

### Question 3 :

The name of Organ ( A ) is : \_\_\_\_\_

The name of Organ ( B ) is : \_\_\_\_\_

### Question 4 :

Regarding this temperature chart : What is the characteristic Feature of this pattern :

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### Question 5 :

The name of the Parasitic stage ( A ) is : \_\_\_\_\_

The name of the Parasitic stage ( B ) is : \_\_\_\_\_



**Question 6 :**

Identify the parasite indicated on the field (genus only)  
.....

**Question 7 :**

How is this parasite transmitted ? :  
.....

**Question 8 :**

Name the clinical condition that may developed as a result of this infection?  
.....

**Question 9 :**

What is the habitat of this parasite in human ?  
.....

**Question 10 :**

What is the stage of the parasite ?  
.....

**Question 11 :**

What is the main mode of the infection ?  
.....

**SLIDE 1:**

- a) The scientific name of the parasite is .....
- b) The stage shown in the slide is .....
- c) Main morphological feature is .....
- d) The habitat in man is .....

**SLIDE 3 :**

- a) The tissue examined is .....
- b) The scientific name of the parasite is .....
- c) The infective stage to man is .....
- d) The diagnostic stage is .....

