



**NAMIBIA UNIVERSITY
OF SCIENCE AND TECHNOLOGY**

Faculty of Health, Applied Sciences and Natural Resources

Department of Health Sciences

QUALIFICATION: BACHELOR OF MEDICAL LABORATORY SCIENCES	
QUALIFICATION CODE: 08BMLS	LEVEL: 8
COURSE: INTEGRATED CLINICAL PATHOPHYSIOLOGY	COURSE CODE: ICP811S
DATE: JUNE 2022	SESSION: THEORY
DURATION: 3 HOURS	MARKS: 170

FIRST OPPORTUNITY EXAMINATION	
EXAMINER(S)	Ms Roselin Tsauses, Mrs Fredrika Engelbrecht, Dr Maurice Nyambuya, Dr Munyaradzi Mukesi
MODERATOR:	Prof Glenda Davison

INSTRUCTIONS
<ol style="list-style-type: none">1. Answer ALL the questions.2. Write clearly and neatly.3. Number the answers clearly.

PERMISSIBLE MATERIALS

1. Pen
2. Calculator

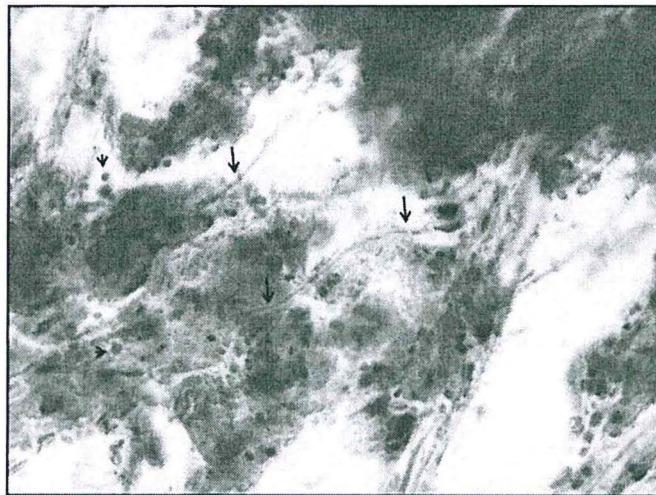
THIS QUESTION PAPER CONSISTS OF 6 PAGES (Including this front page)

SECTION A (79 MARKS)

Question 1

[10]

1.1 An 11-month-old girl with 1-month history of emesis, gagging, and choking with textured foods was brought to her paediatrician by her parents and, after examination, was admitted for management. The prior month, she was briefly admitted to the hospital for a respiratory syncytial virus bronchiolitis and was given oral prednisone 10 mg twice a day for 5 days. On current admission, the baby underwent an oesophagogastroduodenoscopy. The middle to distal oesophagus was covered with yellow-white plaques scattered over the mucosa. The mucosa was hyperaemic and friable, and the plaques could not be washed off. The lesions bled easily at the site of attachment, where they were brushed for cytology. Biopsies were also taken. Fungal pseudo hyphae and spores, morphologically consistent with *Candida* species, were also present as seen in the figure below.

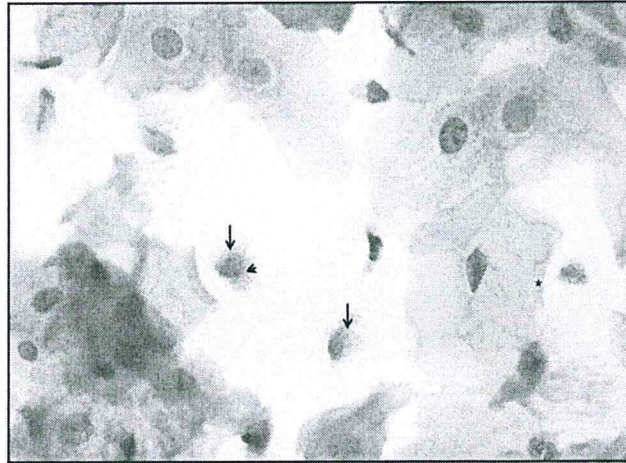


- a) What are the clinical presentations of candidiasis in different groups of patients? (4)
- b) Discuss non-cytological methods used to identify *Candida* spp. in the laboratory. (6)

Question 2

[14]

2.1 A 67-year-old male with a past medical history of urolithiasis and blood in his urine (gross hematuria) presented to his primary care physician for follow-up. Urine was collected and sent for cytologic examination. Microscopic examination of the slide revealed benign urothelial and squamous cells in a background of acute inflammation and red blood cells. Incidentally, scattered, small, oval-shaped "cells" with eccentric dark nuclei and gray cytoplasm with rare red cytoplasmic granules were also seen as indicated in the figure below. The cytologic findings were consistent with *Trichomonas* organisms. **[Print in colour]**



- a) What is Trichomoniasis and how is it transmitted? (4)
- b) Describe the cytological features of trichomonas vaginalis. (6)
- c) Differentiate between the two main types of herpes simplex virus. (4)

Question 3 [17]

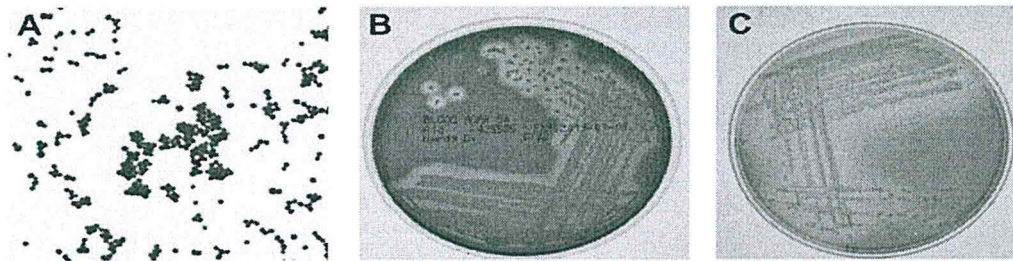
3.1 A 61-year-old Malay male who was first diagnosed with hepatocellular carcinoma presented with progressive jaundice, fever, and abdominal pain for 5 months duration. There was associated loss of weight of 6 kg. His computed tomography (CT) abdomen showed evidence of liver cirrhosis. The cause of liver cirrhosis is unknown.

- a) Suggest further biochemical tests that can be performed on this patient. (10)
- b) Which haematological tests would you perform for this patient AND what would you expect your results to be? Motivate your answer. (4)
- c) Briefly describe the histopathological examination that may be performed and its significance. (3)

QUESTION 4 [30]

4.1 A 15-year-old Caucasian school girl presented to the Emergency Department (ED) complaining of a single day history of lower abdominal pain, muscle aches, diarrhoea, and vomiting. She had a tampon in situ for 24 hours for menstrual bleeding. She had been undergoing treatment for thyroid nodular disease using carbimazole 10 mg twice daily, which she had ceased 3 days previously. On initial examination, the patient was

hypotensive (systolic blood pressure 75 mmHg), pyrexia (temperature 39.4°C), and tachycardic (heart rate 150/minute). There were signs of multiorgan dysfunction as her skin peripheries were profoundly vasoconstricted and mottled with a significant delay in capillary refill time (10 seconds) and an elevated serum lactate (13.0 mmol/L). The patient was acutely confused and intermittently drowsy. There was a generalized lower abdominal tenderness. Vaginal examination revealed a malodorous tampon, coated in a green mucopurulent discharge, which was removed. Laboratory results from a high vaginal swab from this girl presented with the following:



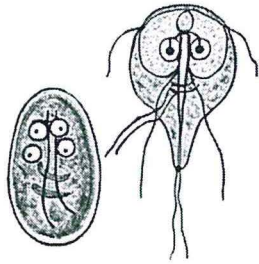
- i) Gram stained slide, ii) Blood agar cultured plate iii) MSA plate
- a) What organism is responsible for this infection? (2)
- b) What virulence factors is mostly responsible for the symptoms in this patient? (2)
- c) Suggest the expected abnormalities seen in the full blood count of this patient, and explain your answer? (6)
- d) Propose the expected CRP result of this patient and justify your answer. (20)

QUESTION 5

[8]

5.1 A patient of 9.5-year-old, with chronic abdominal pain was admitted in the Gastroenterology and Nutrition Service and integrated to: The chronic abdominal pain protocol, authorized by the Ethical and Research Committee of the Instituto Nacional de Pediatría. The patient had history of diarrhoea or pasty stools, neither fever nor vomiting. The faeces from the patient were processed seeking for pathogenic bacteria and the results were negative. The microscopic examination looking for cysts and ova revealed cysts and trophozoites. Haematological analysis revealed the following: a decrease in haemoglobin and haematocrit values. Increase in total leukocyte count, specifically eosinophils.

- a) Identify the cysts and trophozoites presented in the illustration below which were seen during the microscopic examination of the patient sample. (2)



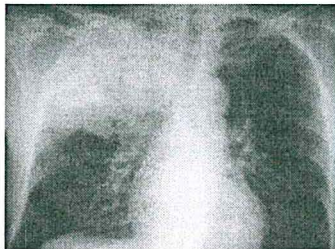
- b) What result, other than the microscopy, in the case study, is indicative of this patient's condition? Give other causes that could also result in the specific trend in the pathology. (4)
- c) What are the routes of transmission for this parasite? (2)

SECTION B (91 MARKS)

QUESTION 6

[31]

A 55-year-old man with persistent cough, fever, night sweats, loss of weight, anorexia, malaise and weakness for 3 months, presented to the hospital. Chest X-ray suggested upper lobe consolidation. Hematological examination revealed mild leukocytosis.



- 6.1 Suggest a diagnosis? (1)
- 6.2 What specimen would you collect? (1)
- 6.3 Explain how the specimen processed and the necessary test done (3)
- 6.4 Outline how this presentation affects serum concentration of different analytes. Use relevant examples to illustrate your answer. (10)
- 6.5 After a prolonged infection with the disease causative agent, coagulation tests revealed hypercoagulation. Discuss how the primary diagnosis could have contributed to the hypercoagulable state in this patient (10)
- 6.6 Match the types of DNA damage 1. to 6. to the most appropriate of the DNA repair mechanisms a. to d. that can be expected to repair the damage (can be more than one). (6)

Type of DNA damage	DNA repair mechanisms
1. Disintegration of a sugar residue due to oxidative damage. 2. Simple base modification, such as 8oxoguanine. 3. A double-stranded DNA break occurring in G1 phase. 4. A pyrimidine dimer 5. An abasic site due to depurination 6. A double-stranded DNA break occurring in G2 phase.	a) On homologous end joining b) Base excision repair c) Nucleotide excision repair d) Homologous recombination-mediated DNA repair

QUESTION 7

[30]

Describe the biochemical tests you would carry out in each of the situations presented below. In each case, justify the choice of tests.

- 7.1** An adult female patient who presented at her Gynaecologist with a suspected case of infertility after several months of unprotected intercourse. (10)
- 7.2** The laboratory investigations you would carry out on a 23-year presenting with visible jaundice? (10)
- 7.3** A patient presenting with diabetes ketoacidosis. (10)

QUESTION 8

[30]

Fluid accumulation between serous membranes can be a result of either transudates or exudates.

- 8.1** Briefly explain the basis of exudation. (10)
- 8.2** Discuss the biochemical changes which are expected in a patient presenting with an exudate (10)
- 8.3** Analyse the protein content of exudates, indicating the different protein components and explain their existence. (10)

TOTAL MARKS: 170