THE OPEN UNIVERSITY OF SRI LANKA
FACULTY OF HEALTH SCIENCES
DEPARTMENT OF MEDICAL LABORATORY SCIENCES
ACADEMIC YEAR 2020/2021 – SEMESTER II

BACHELOR OF MEDICAL LABORATORY SCIENCES HONOURS
MDU6705- WORK BASED TRAINING IV
FINAL EXAMINATION

DURATION: THREE HOURS

DATE: 11TH OCTOBER 2022

TIME: 9.30 AM – 12.30 PM

INDEX NO: .....

IMPORTANT INSTRUCTIONS/INFORMATION TO CANDIDATES

- This question paper consists of **13 pages** with **06 Practical Based Witten Questions.**
- Write your **Index Number** in the space provided.
- Answer **ALL** questions.
- Write answers within the space provided.
- Do not remove any page/part of this question paper from the examination hall.
- Mobile phones and any other electronic equipment are **NOT** allowed. Leave them outside.

Practical Based Written Questions (600 marks)

Q1

A cerebrospinal fluid (CSF) sample collected from a 60-year-old patient suspected of having meningitis has been sent for biochemical and microbiological investigations. Sample was received to the laboratory with a delay of more than 2 hours.

1.1 CSF samples for microbiological investigations are not rejected even sample was received more than 2 hours of collection. Give the reason. **(05 marks)**

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1.2 Which tests should be performed on the CSF sample of the above patient? **(10 marks)**

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1.3 Briefly explain how would delayed processing affect the findings of the each test you mentioned in 1.2. **(30 marks)**

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1.4 Once you received the above sample, what are the steps to be taken prior to the processing of the sample? **(20 marks)**

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1.5 Suggest actions to be taken to correct the issue and prevent the same pre-analytical error from occurring again in the future. **(35 marks)**

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(Total – 100 marks)

Q2

Interpretation of bone marrow smear is mainly dependent on the quality of the sample and the quality of smear preparation and staining. As a medical laboratory technologist, you are responsible for preparing a quality bone marrow smear to aid the hematological diagnosis.

2.1 Mention two (02) difficulties you could face while preparing a quality bone marrow smear. **(10 marks)**

I. .....

II. .....

2.2 State actions you took to overcome each difficulty you mentioned in 2.1. **(10 marks)**

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2.3 Briefly explain the components included in a bone marrow aspirate report of a patient diagnosed with Acute Myeloid Leukemia (AML). **(40 marks)**

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2.4 Discuss the turnaround time of bone marrow report in your laboratory. Include time taken from collection to processing, issue first report (written/ verbal) of aspirate and trephine, issue final report combined aspirate and trephine report. (40 marks)

(Total – 100 marks)

Q3

The Head of the Pathology Department made a complain to the quality control manager of the laboratory on the poorly stained Hematoxylin and Eosin (H & E) histological tissue sections received for examination which are impossible to accurately diagnose the disease. He wanted to fix the issue as soon as possible and send them back for examination.

According to the given information, all the H & E stained tissue sections received on that day were

- stained pale
- nuclei are stained a faint blue and can't see nuclear detail
- eosin appears to be washed out

When you assessed the slides received on the previous day with the pathologists, those were exceptionally good, and the nuclei are stained dark blue with visible nuclear details. The eosin is stained in three distinct shades of pink.

3.1 State five (05) errors of the H & E staining procedure which may give poor staining quality mentioned above. **(25 marks)**

I. .....

II. .....

III. .....

IV. .....

V. .....

3.2 As the quality manager of the laboratory, how do you investigate the cause of issue?

(25 marks)

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3.3 Once you found the cause of the issue, what actions would you take to fix the issue and prevent future occurrences. **(35 marks)**

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3.4 Discuss three (03) routine quality maintenance requirements of H & E automated slide stainer. **(15 marks)**

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(Total - 100 marks)

Q4

Liver profile and haematological findings of a 30-year-old male patient complaining of having marked loss of appetite, low-grade fever, nausea and vomiting during the last five days are given below. Clinical history notified the yellowish discolouration of eyes, and slightly enlarged liver. No history of taking alcohol.

Biochemical investigations		
AST (IU/L)	2152	7-55
ALT (IU/L)	2673	8-48
ALP (IU/L)	90	45-115
Albumin (g/dL)	3.4	3.5-5
Total protein (g/dL)	6.7	6.3-7.9
Total bilirubin (mg/dL)	15.5	0.1-1.2

Haematological investigations		
White blood cells (µL)	5.306	4,500 -11,000
Platelet count (× 1,000/µL)	177	150 - 450
Haemoglobin (g/dL)	14.5	14.0 - 17.5
Prothrombin time (INR)	1.3	< 1.5

Alanine aminotransferase (ALT); Aspartate aminotransferase (AST); Alkaline phosphatase (ALP)

4.1 Comment on the possible diagnosis while connecting the liver profile parameters and clinical history of the patient. **(30 marks)**

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4.2 Comment how haematological parameters would aid the diagnosis? **(20 marks)**

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4.3 Suggest three (03) viral causes and two (02) non-viral causes that are compatible with the given liver profile of the patient. **(10 marks)**

Viral causes	Non-viral causes

4.4 Discuss further laboratory investigations required to identify the three possible causative viral agents that you mentioned in 4.3. **(40 marks)**

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(Total – 100 Marks)

Q5

Assume that you are the senior medical laboratory technologist of the cytology section. You noticed that PAP smears sent from the Medical Officer of Health (MOH) office are unsatisfactory. When you assessed the past PAP smears sent by the same MOH office with the pathologist, it was found that most of the smears were not in good quality.

5.1 What is meant by an "unsatisfactory" PAP smear according to the definition of Bethesda system 2001. (15 marks)

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5.2 Outline the line of reporting you should follow to correct the issue? (20 marks)

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5.3 When you examined a PAP smear, you observed several *Trichomonas vaginalis* trophozoites on the smear. What actions would you take upon noticing the *Trichomonas vaginalis* on the PAP smear? **(30 marks)**

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5.4 Discuss a laboratory investigation to be carried out on the patient mentioned in the section 5.3 to confirm the disease condition. **(35 marks)**

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(Total – 100 marks)

Q6

A 52-year-old female with a history of ovarian cancer, underwent a successful surgery followed by 6 cycles of chemotherapy. She achieved a complete remission and did well for 1 year until she was diagnosed with a rise in Cancer Antigen (CA)-125 levels during the last three months.

	April 2022	May 2022	June 2022
CA-125 U/mL	70.4	81.6	111.2

Reference range: 0-35 U/mL

6.1 With the aid of the given history, comment on the CA-125 levels. **(10 marks)**

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6.2 "CA-125 is not a suitable tumor marker for screening ovarian cancer in a low-risk population". As an experienced medical laboratory technologist, discuss your views on the statement with regards to analysis of tumor markers statement. **(40 marks)**

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6.3 Different clinical laboratories use different techniques to measure serum CA-125 level. Explain the quality control procedure of the CA-125 assay used in your laboratory.

(35 marks)

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6.4 Vaginal discharge of the above patient revealed many budding yeast cells. Using a flow chart, illustrate the follow up laboratory procedures to diagnose the disease condition.

(15 marks)

(Total – 100 marks)

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