

EXAMINATION FOR QUALIFIED MEDICAL LABORATORY TECHNICIAN



Subject: SPECIMEN SERVICES

Examination Date: 7 October 2023

Time Allowed: 3 hours – 9.30am – 12.40pm
10 minutes extra time for reading the Paper

Candidate Name: _____

Candidate No.: _____

General Instructions

1. Total marks for paper = 100.
2. Marks for each question are as indicated.
3. The paper consists of:

	<i>Common</i>	<i>Discipline Specific</i>
Section A, questions 1-30 = Total Marks 15	6 Marks	9 Marks
Section B, questions 31-37 = Total Marks 10	5 Marks	5 Marks
Section C, questions 38-41 = Total Marks 10	4 Marks	6 Marks
Section D, questions 42-45 = Total Marks 5	5 Marks	0
Section E, questions 46-68 = Total Marks 40	10 Marks	30 Marks
Section F, questions 69-70 = Total Marks 20	0	20 Marks
4. All questions are to be attempted.
5. Use of calculator is permitted.
6. Put all answers into the examination booklet provided.

© Copyright Notice

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without the prior permission of "The New Zealand Institute of Medical Laboratory Science", PO Box 505, Rangiora 7440, New Zealand.

WORD DEFINITIONS	
Calculate	Perform a mathematical process to get the answer
Classify	Be able to designate to a group
Compare	Detail both the differences and the similarities
Complete	Finish, have all the necessary parts
Convert	Express in alternative units
Define	State meaning clearly and concisely
Describe	Give a complete account demonstrating a thorough practical knowledge
Discuss	Give details, explaining both the positives and negatives
Distinguish	To briefly point out the main differences
Expand	To express at length or in a greater detail
Identify	Recognise according to established criteria
Indicate	Briefly point out
Interpret	Express the results of a test or series of tests in a meaningful format
Label	Give a name to
List	Headings only
Match	Find one that closely resembles another
Name	A word or group of words used to describe or evaluate
Outline	Write brief notes incorporating the essential facts
State	Give the relevant points briefly

SECTION A

Section A – Question 1 to Question 30 = Total Marks: 15

Multi choice questions

Multi choice questions – choose one answer for each question

(0.5mark per correct answer)

Circle the letter for the correct answer

Example. Which of the below is a primary colour?

- a. Green
- b. Purple
- ☒ c. Red
- d. Orange

C.1 A synovial fluid is taken from:

- a. The eye
- b. A vein
- c. A joint
- d. An artery

C.2 The cardiovascular system is also referred to as the:

- a. Circulatory system
- b. Endocrine system
- c. Respiratory system
- d. Lymphatic system

C.3 The Medical Sciences Council is responsible for:

- a. Offering a CPD programme
- b. Issuing an Annual Practicing Certificate
- c. Providing QMLT examinations
- d. Laboratory auditing

C.4 Leukemia is primarily diagnosed in which department in the laboratory?

- a. Haematology
- b. Histology
- c. Microbiology
- d. Biochemistry

- C.5 The prefix “hypo” refers to:
- a. Inflammation
 - b. Excessive
 - c. Increased
 - d. Decreased
- C.6 Standard precautions refers to:
- a. Cleaning the laboratory regularly with an appropriate disinfectant
 - b. Treating all blood and body fluids as potentially infectious
 - c. Following the rules set by the Health and Safety Officer
 - d. Compulsory use of Personal Protective Equipment
- C.7 Which best describes confidential information?
- a. Information given on the understanding that it will not be passed on to others.
 - b. Information that is stamped or marked as “Confidential”
 - c. Information that can only be passed on to a doctor or family member.
 - d. Clinical details written on a form
- C.8 A pathologist is a:
- a. Registered Medical Practitioner
 - b. An advanced Medical Laboratory Scientist
 - c. A specialised Scientific Officer
 - d. Registered Clinical Scientist
- C.9 Within the complaints process of The Code of Health & Disability Services and Consumer Rights, the complaint must be acknowledged in writing within how many working days?
- a. 7 days
 - b. 10 days
 - c. 5 days
 - d. 20 days
- C.10 A method of representing data in a visual, machine-readable form describes:
- a. A histogram
 - b. A cell scanner
 - c. A flow chart
 - d. A barcode

- C.11 “It is the duty of Members to uphold the dignity and honour of the profession, to accept its ethical principles and not engage in any activity that would discredit the profession” is part of:
- HPCA Act 2003
 - Health and Disabilities requirement of all staff
 - NZIMLS code of ethics
 - Medical Sciences Council of New Zealand practitioner requirement
- C.12 Venesection, venipuncture, phlebotomy and blood collection all come under what scope of practice?
- Medical Laboratory Scientist
 - Medical Laboratory Technician
 - Pre analytical Technician
 - Health Care Assistant
- D.13 Potassium oxalate is the anticoagulant in which blood tube?
- Fluoride
 - EDTA
 - Citrate
 - Heparin
- D.14 Which is the correct term for an increase in potassium levels in the blood?
- hypernatremia
 - hyperkalaemia
 - hyperglycaemia
 - hypercalcaemia
- D.15 Which is the correct order of draw for blood specimens?
- EDTA, citrate, heparin, blood culture
 - EDTA, blood culture, heparin, citrate
 - Blood culture, citrate, heparin, EDTA
 - Blood culture, EDTA, heparin, citrate
- D.16 Blood smears from EDTA specimens are prepared within 1 hour of collection:
- to minimise changes in cellular morphology
 - to reduce acceleration of activators
 - to prevent removal of plasma cells
 - to promote rigid quality monitoring

- D.17 Which analyte in sweat is used for the diagnosis of cystic fibrosis?
- a. sodium
 - b. chloride
 - c. potassium
 - d. calcium
- D.18 Which type of fluid is aspirated from the abdominal cavity by paracentesis?
- a. pericardial fluid
 - b. pleural fluid
 - c. perivascular fluid
 - d. peritoneal fluid
- D.19 An increase in bilirubin in the blood is seen in which condition?
- a. Jaundice
 - b. Pallor
 - c. Anaemia
 - d. Gangrene
- D.20 Which test is used to diagnose problems of carbohydrate (glucose) metabolism?
- a. Lactose Intolerance Test
 - b. Oral Glucose Challenge Test
 - c. 2 Hour Post Prandial Glucose Test
 - d. Glucose Tolerance Test
- D.21 Within which timeframe must Quantiferon TB Gold Tubes be transferred to an incubator?
- a. 18 hours of collection
 - b. 16 hours of collection
 - c. 20 hours of collection
 - d. 24 hours of collection
- D.22 Why is it not safe for dry ice to be stored in a tightly sealed container?
- a. Risk of explosion
 - b. Potential for asphyxiation
 - c. Contact hazard with the container
 - d. Exceeding occupational exposure limits

- D.23 Which of the following is an example of correct specimen transport?
- a. Placing the specimen in a regular container
 - b. Protecting the specimen from light to maintain the correct temperature
 - c. Mixing different types of specimens per patient in the same bag
 - d. Using a leak-proof and properly labelled container
- D.24 What is the clear liquid part of the blood that remains after blood cells and clotting proteins have been removed?
- a. Platelets
 - b. Plasma
 - c. Serum
 - d. Oxygenated blood
- D.25 Which of the following tests need special chain-of-custody documentation when the specimen is collected?
- a. Mantoux
 - b. Cross-match
 - c. Drug Screen
 - d. Blood Culture
- D.26 Which type of specimen is considered irreplaceable?
- a. cervical smears
 - b. urine
 - c. tissue
 - d. blood
- D.27 What is the correct way to dispose of dry ice?
- a. in biohazard waste bins
 - b. in a well-ventilated area
 - c. in a sink
 - d. in a chemical waste container

- D.28 A blood collection tube has an expiry date of March 2023. When is the last day the tube can be used?
- a. the last day in March
 - b. the first day in April
 - c. the first day in March
 - d. the last day in February
 - e.
- D.29 How long should eyes be rinsed using an eyewash in the event of a chemical splash?
- a. 5 minutes
 - b. 10 seconds
 - c. 15 minutes
 - d. 30 seconds
- D.30 What is the purpose of centrifuging a specimen in the pre-analytical phase?
- a. Separating cells from the liquid portion of the specimen
 - b. Enhancing microbial growth in culture specimens
 - c. Preventing coagulation of the specimen
 - d. Reducing specimen volume for storage

(Total: 15 marks)

END OF SECTION

SECTION B

Labelling of diagrams e.g. anatomy, hazard identification, instrument



Section B – Question 31 to Question 37 = Total Marks: 10

(Answer all questions)

C.31 Name the following hazard symbols

(1 mark)

(0.5 marks per correct answer)

a.		b.	
----	---	----	--



a. _____

b. _____

C.32 Name the instruments and describe their use

(2 marks)

(1 mark per correct answer)

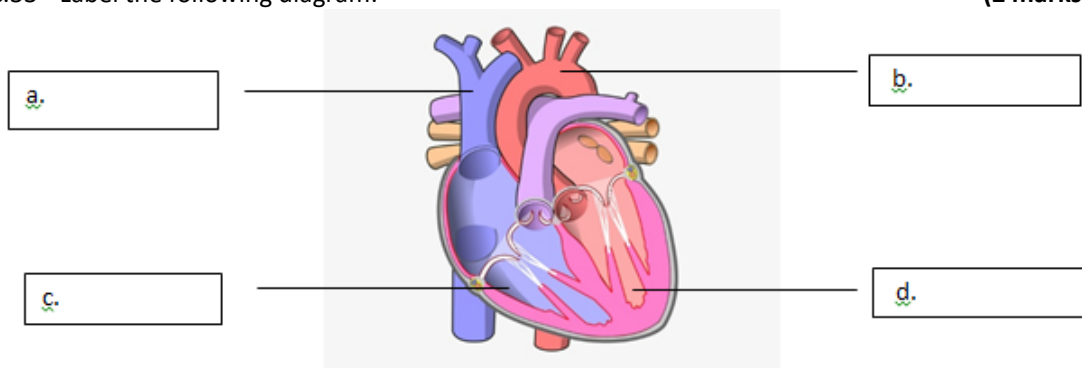
a.		b.	
----	---	----	--

a. _____

b. _____

C.33 Label the following diagram:

(2 marks)



- a. _____
- b. _____
- c. _____
- d. _____

D.34 Name the laboratory equipment:

(0.5 marks)



D.35 Name the laboratory equipment:

(0.5 marks)



D.36 a. Name the laboratory equipment:

(1.5 marks)



(0.5 marks)

a. _____

b. List **TWO** (2) safety features of the equipment pictured above in D.36a: (1 mark)

b. _____

D.37 a. Name the test that requires this set of tubes:

(2.5 marks)



a. _____ (0.5 mark)

b. Name each specific tube pictured above: (2 marks)

Cap Colour	Tube Name
Purple	
Green	
Yellow	
Grey	

(Total: 10 marks)

END OF SECTION

SECTION C

Tables, match column definition

Section C – Question 38 to Question 41 = Total Marks: 10

(Answer all questions)

- C.38 Match the columns by **writing the Roman numeral from list B** against the correct match in Column A **(2 marks)**

Column A	Column B
A. Hepatic	i. Knee
B. Nephritis	ii. Liver
C. Patella	iii. Molecular
D. PCR	iv. Kidney

Column A	Column B
A. Hepatic	
B. Nephritis	
C. Patella	
D. PCR	

- C.39 Expand the common abbreviations: **(2 marks)**

A.	B.
a. ACF	
b. CML	
c. COPD	
d. NAAT	

D.40 Match the columns by **writing the Roman numeral from list B** against the correct match in Column A **(4 marks)**

Column A	Column B
A. Urine Porphyrin	i. 37°C
B. Ammonia	ii. Protect from light
C. Cold Agglutinin	iii. 24 hour Urine
D. Urine Chlamydia	iv. Kept at -20°C
E. Creatinine clearance	v. Ice Slurry
F. Serum Amino Acid	vi. Acidified Urine
G. Aldosterone	vii. First Catch Urine
H. Urine Catecholamine	viii. Room Temperature

Column A	Column B
A. Urine Porphyrin	
B. Ammonia	
C. Cold Agglutinin	
D. Urine Chlamydia	
E. Creatinine clearance	
F. Serum Amino Acid	
G. Aldosterone	
H. Urine Catecholamine	

D.41 Match the columns by **writing the Roman numeral from list B** against the correct match in Column A **(2 marks)**

Column A	Column B
A. Biochemistry	i. Coombs/DAT
B. Haematology and Coagulation	ii. Quantiferon TB Gold
C. Transfusion Medicine	iii. GTT and Polycose
D. Virology and Immunology	iv. Platelet Function Assay

Column A	Column B
A. Biochemistry	
B. Haematology and Coagulation	
C. Transfusion Medicine	
D. Virology and Immunology	

(Total: 10 marks)

END OF SECTION

SECTION D*Calculations***Section D – Question 42 to Question 45 = Total Marks: 5****Calculations**

C.42 A patient has had daily Sodium and Potassium tests done for one week, the results are as follows:

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Sodium	135.7	135.9	136.3	136.9	137.2	136.5	135.4
Potassium	3.9	4.2	4.8	4.1	3.8	4.0	3.6

Calculate the mean Sodium and Potassium for the week. (Show all workings) **(2 marks)**

C.43 Convert **(1.5 marks)**

32.7 mg to _____ kg

$\frac{5}{8}$ to _____ %

200 uL to _____ mL

C.44 A test has been set up at 1730hrs and has an incubation time of 18 hours, the requester is asking what time they could expect the result (assume the result can be given as soon as the incubation period is complete). **(0.5 marks)**

- C.45 A colleague accidentally made one litre of 20% solution of Trigene, you have been asked to use that solution and make one litre of 2% Trigene.

Explain your process and show any calculations or workings.

(1 mark)

(Total: 5 marks)

END OF SECTION

SECTION E

Short answer questions (answers = one or more words, short sentences)

Section E – Question 46 to Question 67 = Total Marks: 40

Short Answer Questions

C.46 Define document control. **(2 marks)**

C.47 Outline the First Aid and Treatment for fainting or unconscious episode of a staff member or patient you are working with. **(1.5 marks)**

C.48 When referring to laboratory results the term “accuracy” is best described as: **(0.5 marks)**

C.49 Outline the principle purpose of the Health Practitioners Competency Assurance Act 2003. **(1.5 marks)**

C.50 Describe why user specific passwords are important when using a Laboratory Information System (Computer System) **(1.5 marks)**

C.51 Describe why it is important for the laboratory to have a robust specimen labelling policy. **(1.5 marks)**

C.52 Define Patient/Donor confidentiality: **(1.5 marks)**

D.53 a. Define Haemolysis **(2 marks)**
(0.5 mark)

a.

b. List **THREE** (3) common causes of haemolysis during blood collection. *(1.5 marks)*

b.

D.54 List **Two** (2) chemistry blood tests included in cardiac biomarkers. **(1 mark)**

D.55 a. Name **TWO** (2) laboratory blood tests that are best collected in the morning. **(1.5 marks)**
(1 mark)

a.

b. State why: *(0.5 mark)*

b.

D.56 Outline the collection, transport, and the pre-test specimen preparation requirements for a D-dimer test. **(2 marks)**

D.57 Expand the acronyms below. **(2 marks)**

- a. UGIB

- b. PFA

- c. BMI

- d. ETOH

D.58 a. Distinguish between a first catch urine sample and a midstream urine sample. **(3 marks)**
(2 marks)

a.

b. Name **(ONE)** 1 laboratory test for both sample types: *(1 mark)*

b.

D.59 a. Define Therapeutic Drug Monitoring (TDM) **(2.5 marks)**
(0.5 marks)

a.

b. Distinguish the differences between monitoring a peak drug level and a trough drug level *(2 marks)*

b.

D.60 State **TWO** (2) reasons for transporting specimens on ice. (1 mark)

D.61 List **TWO** (2) reasons why a serum aliquot can appear turbid. (1 mark)

D.62 a. Define Biopsy (1 mark)
(0.5 marks)

a. _____

b. Define the function of Formalin in Anatomical Pathology samples: (0.5 marks)

b. _____

D.63 a. Expand the abbreviation CSF: (2 marks)
(0.5 marks)

a. _____

b. Name the procedure performed to collect CSF for laboratory testing (0.5 marks)

b. _____

c. List TWO (2) disorders detected by testing the CSF specimen (1 mark)

c. _____

D.64 List **THREE** (3) pre-analytical errors: (1.5 marks)

D.65 Outline the procedure on how to deal with Spills in a Centrifuge: **(2 marks)**

D.66 Indicate **THREE (3)** types of personal protective equipment and their use in the laboratory. **(3 marks)**

D.67 Outline the procedure on how to use a pH strip: **(1.5 marks)**

D.68 Name **THREE (3)** parts of a centrifuge and indicate their uses. **(3 marks)**

(Total: 40 marks)

END OF SECTION

ESSAY

Section F – Question 69 to Question 70 = Total Marks: 20

Essay Questions

ESSAY

Section F – Question 69 to Question 70 = Total Marks: 20

Essay Questions

ESSAY

Section F – Question 69 to Question 70 = Total Marks: 20

Essay Questions

D.69 In essay format, discuss the pre-analytical procedure for a 5-HIAA 24-hour urine test, from the preparation required for specimen collection through to preparation of the sample for urinalysis.

(10 marks)

[illegible]

[illegible]

D.70 In an essay format, discuss how the principle of operation of a fume hood relates to its use, compared to the principle of operation and use of a Class II Biosafety Cabinet. **(10 marks)**

This image shows a full page of blank, lined paper. It features approximately 28 horizontal black lines spaced evenly across the page, typical of notebook paper. The lines are thin and extend from the left edge to the right edge. There are no margins, text, or other markings on the page.

[illegible]

END OF SECTION