

EXAMINATION FOR QUALIFIED MEDICAL LABORATORY TECHNICIAN



Subject: Specimen Services

Examination Date: Saturday 6 November 2021

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

Candidate Number: «Member_No»

Name: «First_Name» «Surname»

General Instructions

1. Total marks for paper = 100.
2. Marks for each question are as indicated.
3. The paper consists of common syllabus and discipline specific questions.
The relevant breakdown of marks is indicated under each Section Heading.
To pass the QMLT examination, candidates must gain a minimum of a C grade (50%) in the common syllabus examination component and a minimum of a C grade (50%) in the discipline specific component of the written examination.
4. All questions to be attempted.
5. Use of a calculator is permitted.
6. Write all answers into this examination booklet. Extra pages are provided at the back of this examination paper booklet if you require more space to write answers. Ensure you indicate the answer is continued on an additional page and label these additional pages clearly with your candidate number and the number of the question you are answering.

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WORD DEFINITIONS	
Calculate	Perform a mathematical process to get the answer
Classify	Be able to designate to a group
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
Differentiate	Briefly and concisely state the main differences
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
Label	Give a name to
List	Headings only
Match	Find one that closely resembles another
Outline	Write brief notes incorporating the essential facts
Recognise	Be able to identify the main points

SECTION A

Multi Choice Questions - choose one answer for each question

Common Curriculum Questions C.1 - C.12 = 6 marks

Discipline Specific Questions D.13 - D.30 = 9 marks

(0.5 marks per correct answer)

Total Marks = 15 marks

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 Agreeing to something once provided with all the facts is an example of:

- a. Confidential information
- b. Work place ethics
- c. Informed consent
- d. Human resource management

C.2 Which organisation is responsible for issuing an Annual Practising Certificate?

- a. Medical Sciences Council of New Zealand
- b. New Zealand Institute of Medical Laboratory Science
- c. New Zealand Ministry of Health
- d. New Zealand Qualification Authority

C.3 Harmonisation is:

- a. The process leading to the uniformity of test results from different methods
- b. Where staff are encouraged to work happily together
- c. The process of taking tests out of one laboratory and sending to another to save money
- d. The process of review of laboratory procedure to make things run smoothly

C.4 Alveoli are found in which organ?

- a. Heart
- b. Brain
- c. Lung
- d. Kidney

- C.5 Specimens transported throughout New Zealand must adhere to which industry standard?
- a. IANZ guideline
 - b. NATA guidelines
 - c. CDC guidelines
 - d. IATA guidelines
- C.6 Standard precautions refers to:
- a. Treating all body fluids including blood as potentially infectious
 - b. Wearing gloves at all times when handling patient samples
 - c. Ensuring all staff are aware of all laboratory hazards and have read the Health and Safety manual
 - d. Keeping all samples in appropriate leak proof containers.
- C.7 What is the UN number for labelling packages containing Diagnostic Specimens Category A for air transport?
- a. UN 3373
 - b. UN 1845
 - c. UN 2814
 - d. UN 2900
- C.8 A Class 2 biosafety cabinet offers protection to:
- a. Personnel only
 - b. Personnel and products
 - c. Products only
 - d. Personnel and environment
- C.9 What laboratory department is generally responsible for the diagnosis of diabetes?
- a. Microbiology
 - b. Histology
 - c. Blood Transfusion
 - d. Biochemistry

- C.10 Where on the body is the antecubital fossa?
- a. The leg
 - b. The arm
 - c. The waist
 - d. The neck
- C.11 Why is it important to use personalised logons when using laboratory computer systems?
- a. So management know which staff has achieved their KPIs.
 - b. So all entries in the computer are appropriately tracked in accordance with Total Quality Management
 - c. So HR know when staff are working and they can be paid the correct amount.
 - d. So you don't get the blame for other people's errors
- C.12 Belonging to and achieving appropriate Continuing Professional Development is a legal requirement from which Government Act.
- a. Health Practitioners Competency Assurance Act (2003)
 - b. Health and Disability Commissioner Act (1994)
 - c. Health and Safety at Work Act (2015)
 - d. Employment Relations Act (2000)
- D.13 Which of the following specimen types is used to aid in the diagnosis of infective endocarditis?
- a. Sputum
 - b. Skin swab
 - c. Blood culture
 - d. Faeces
- D.14 NZMC number is used to identify:
- a. Requested tests
 - b. Requesting practitioner
 - c. Location of surgery
 - d. Location of requesting practitioner
- D.15 Bronchial washings can be tested in both of these departments:
- a. Cytology and Histology
 - b. Immunology and Histology
 - c. Cytology and Microbiology
 - d. Microbiology and Histology

- D.16 Which of the following statements accurately describes Troponin?
- a. Structural protein in lung tissue
 - b. Structural protein in heart tissue
 - c. Structural protein in liver tissue
 - d. Structural protein in kidney tissue
- D.17 An SST sample needs to be left for at least 30 minutes before it is centrifuged to:
- a. Allow red blood cells to fall to the bottom of the tube
 - b. Allow red blood cells to uniformly resuspend in the tube
 - c. Allow clotting of blood to happen
 - d. Allow serum to absorb all analytes from the red blood cells
- D.18 Synovial fluid is found in the:
- a. Lungs
 - b. Joints
 - c. Stomach
 - d. Sinuses
- D.19 Impaired kidney function with a build-up of waste products in the blood is also known as:
- a. Nephritis
 - b. Cystitis
 - c. Uraemia
 - d. Hyperglycaemia
- D.20 Platelets are a vital component of blood and function:
- a. As a part of ferritin metabolism
 - b. By neutralising bacteria in blood stream
 - c. In blood clotting after injuries
 - d. As a part of skins' allergic response
- D.21 Specimen collected to aid in diagnosis of *Streptococcus B* infection is:
- a. Throat swab
 - b. Urogenital swab
 - c. Sputum
 - d. CSF

D.22 Otitis media is inflammation of the:

- a. Mouth
- b. Pelvis
- c. Ear
- d. Intestine

D.23 Ringworm can be confirmed by which of the following specimen?

- a. Faeces
- b. Bronchial washings
- c. Blood
- d. Skin scraping

D.24 Kleihauer test is requested to determine:

- a. Time of delivery
- b. COPD
- c. FMH
- d. Rh factor

D.25 Which of the following is not an anti-rejection drug?

- a. Cephalosporins
- b. Ciclosporin
- c. Sirolimus
- d. Tacrolimus

D.26 What is the full name of the CPD tube?

- a. Carbon Pyruvate Disaccharide
- b. Cefpodoxime Protein Diphosphate
- c. Calcium Phosphate Dimer
- d. Citrate Phosphate Dextrose

D.27 Malaria screening is conducted on which of the following specimens?

- a. Swab smear
- b. Aspirate smear
- c. Blood smear
- d. CSF smear

D.28 Which of the following specimens requires the collector's signature on the specimen?

- a. Kidney stone
- b. Placenta
- c. Blood bank
- d. Paediatric

D.29 What is the specimen of choice for Yersinia testing?

- a. Blood
- b. CSF
- c. Faeces
- d. Urine

D.30 Reducing substance test is performed when diagnosing:

- a. Sore throat
- b. Sepsis
- c. Headache
- d. Lactose intolerance

Section A: Total 15 marks

SECTION B

Labelling of Diagrams, e.g., Anatomy, Hazard Identification, Instrument

Common Curriculum Questions C.31 - C.33 = 5 marks

Discipline Specific Questions D.34 – D.35 = 5 marks

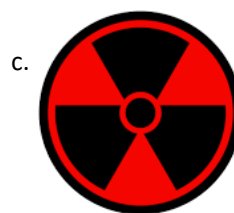
(Answer all questions)

Total Marks = 10 marks

C.31 Name the following hazard symbols:

(0.5 marks per correct answer)

(C.31: 1.5 marks)



a. _____

b. _____

c. _____

C.32 Name the equipment pictured below:

(0.5 marks per correct answer)

(C.32: 1.5 marks)



a. _____

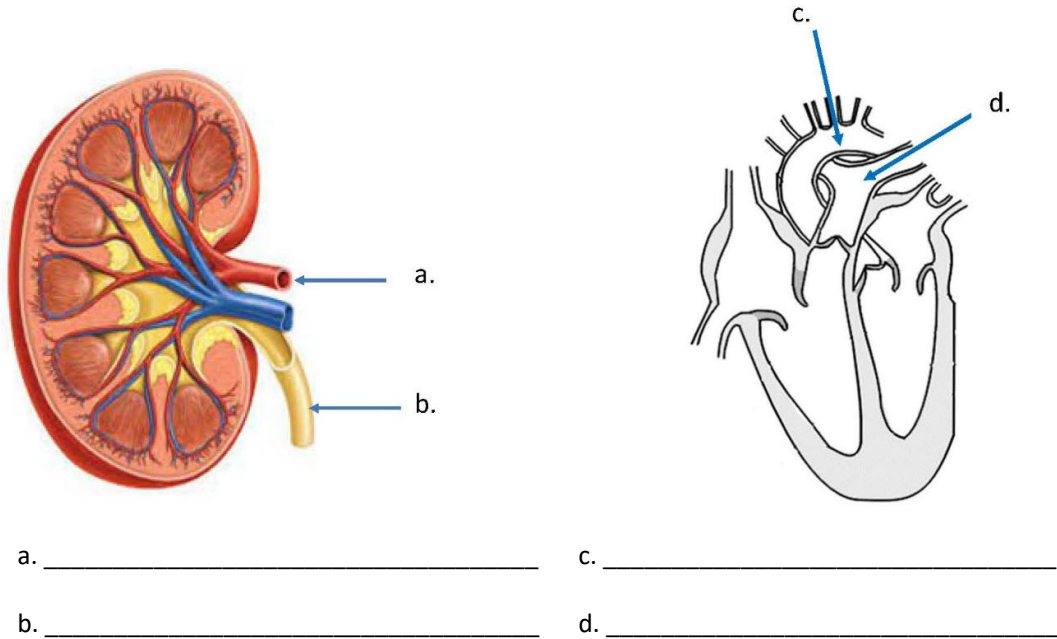
b. _____

c. _____

C.33 Name the anatomical features pictured below indicated by a, b, c and d.

(0.5 marks per correct answer)

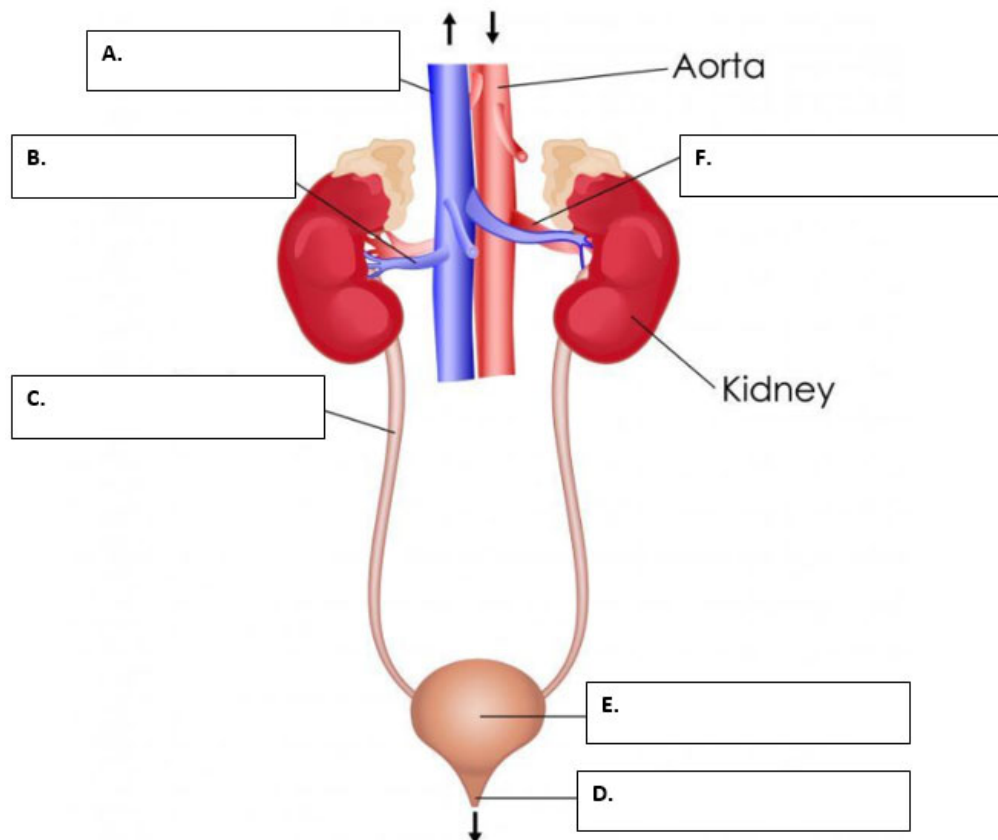
(C.33: 2 marks)



D. 34 The following diagram illustrates the human renal system. Two parts of the system have been labelled. Label the remaining parts.

(0.5 marks per correct answer)

(D.34: 3 marks)



D.35 Name the two items pictured below and state one use for each:

(D.35: 2 marks)

(1 mark each)



a. _____



b. _____

Section B: Total 10 marks

SECTION C

Tables, Match Column Definition

Common Curriculum Questions C.36 - C.37 = 4 marks

Discipline Specific Questions D.38 – D.39 = 6 marks

(Answer all questions)

Total Marks = 10 marks

C.36 Match the definition in column (A) with the correct description in column (B).

Write your answers in the table below. (Roman numeral only required.)

(C.36: 2 marks)

A	B
Accuracy	(i) Nose bleed
Morphology	(ii) Inflammation of the Kidney
Epistaxis	(iii) The science of organic forms and structure
Nephritis	(iv) The ability of a measurement to match the actual value of the quantity being measured

A	B (enter Roman numeral only)
Accuracy	
Morphology	
Epistaxis	
Nephritis	

C.37 Expand the following commonly used laboratory abbreviations. There are both laboratory tests and clinical conditions/details.

(0.5 marks per correct answer)

(C.37: 2 marks)

MI _____

UTI _____

PPE _____

PCR _____

- D.38 Match the terms in column (A) with the correct term in column (B).
 (Roman numeral only required) (0.5 marks per correct answer)
(D.38: 3 marks)

A	B
FISH	i) TB
Antipsychotic	ii) Protein
Bordetella pertussis	iii) Blood gas
Mycobacterium	iv) Chromosome
Albumin	v) Whooping cough
Respiratory alkalosis	vi) Clozapine

A	B (enter Roman numeral only)
FISH	
Antipsychotic	
Bordetella pertussis	
Mycobacterium	
Albumin	
Respiratory alkalosis	

- D.39 Write the following laboratory tests in the column for the body systems they are most associated with: (0.5 marks per correct answer)
(D.39: 3 marks)

(i) Cholinesterase (ii) Uric Acid (iii) Lactic Acid
 (iv) ESR (v) Serotonin (vi) LDH

(See below example for CSF, Alkaline Phosphatase, and CK).

Nervous System	Skeletal System	Muscular System
CSF	Alkaline phosphatase	CK

Section C: Total 10 marks

SECTION D

Calculations

Common Curriculum Questions C.40 - C.43 = 5 marks

Discipline Specific Questions D.44 - D.46 = 5 marks

(Answer all questions)

(Use of a calculator is permitted)

Total Marks = 10 marks

- C.40 A patient needs a specimen taken within 36 hours of flying to meet with travel requirements. They fly at 2130 hr on the 10TH of November.

When is the earliest they can have the specimen collected? Give the date and time.

(C.40: 1 mark)

- C.41 A department needs to demonstrate an increase in workload and is asked to calculate the average number of specimens received for the week.

Day of the week	Monday	Tuesday	Wednesday	Thursday	Friday
Specimens per day	227	243	217	209	186

What is the mean number of samples per day? *(Show calculations)*

(C.41: 1 mark)

- C.42 Convert the following:

(C.42: 2 marks)

0.75 L to _____ mL
1/4 to _____ %
142ug to _____ g
185cm to _____ mm

(0.5 mark per correct answer)
(C.43: 1 mark)

Express the above result as a percentage.

b. $8.46 \text{ pm} =$ _____

SECTION E

Short Answer Questions

Common Curriculum Questions C.47 - C.51 = 10 marks

Discipline Specific Questions D.52 - D.66 = 25 marks

(Answer all questions)

Total Marks = 35 marks

C.47 Define Quality Assurance.

(C.47: 1.5 marks)

C.48 Describe the “Duty of Care” in relation to patient samples. *(0.5 marks per point. Max. 2 marks)*

(C.48: 2 marks)

C.49 List 3 routes of infection from biological material.

(0.5 marks per point. Max. 1.5 marks)

(C. 49: 1.5 marks)

C.50 Outline the prevention of a sharps injury.

(0.5 marks per point. Max. 2 marks)

(C.50: 2 marks)

C.51 Describe Cultural Competence.

(C.51: 3 marks)

D.52 List two (2) reasons why a faecal specimen sent to the laboratory on ice is not ideal for microbiological testing.

(D.52: 1 mark)

D.53 Expand the acronym MRSA and name one occasion when an MRSA test is requested.

(D.53: 1 mark)

D.54 Outline the mode of action of two (2) anticoagulants used in laboratory specimen tubes.

(D.54: 2 marks)

D.55 Distinguish between sterilisation and disinfection.

(D.55: 2 marks)

D.56

(D.56: 4 marks)

a. Define haemolysis and give one common cause. *(1 mark)*

b. Describe the effect of haemolysis on three (3) different analytes. *(3 marks)*

D.57 Explain the laboratory interference if an SST tube is spun before the clotting process is completed. **(D.57: 2 marks)**

D.58 Name the UN number required for the transportation of: **(D.58: 1 mark)**

a. Diagnostic Specimens? UN _____

b. Infectious Substances? UN _____

D.59 List four (4) reasons why a sample would be rejected when received in the laboratory. **(D.59: 2 marks)**

D.60 List four (4) criteria that need to be taken into consideration when manually aliquoting plasma from a centrifuged whole blood sample. **(D.60: 2 marks)**

D.61 List three (3) common abnormal appearances of plasma and the most likely cause of each. **(D.61: 3 marks)**

D.62 Indicate the recommended minimum time for blood to coagulate in a plain (red top) tube. **(D.62: 0.5 marks)**

D.63 Outline why a semen sample for fertility testing is considered as an urgent sample? **(D.63: 1 mark)**

D.64 Outline the reasons for recording the following: **(D.64: 1.5 marks)**

a. Fasting status of a patient. *(0.5 marks)*

b. Pregnancy status of a patient. *(1 marks)*

D.65 Expand the acronym IATA and define the term 'Dangerous Goods' in relation to the IATA regulations on the transportation of dangerous goods by air. **(D.65: 1.5 marks)**

D.66 List one (1) laboratory test that requires to be kept warm (at body temperature of approximately 37°C) after collection. **(D.66: 0.5 mark)**

SECTION F

Essay Questions

Discipline Specific Questions D.67 - D.68 = 20 marks

(Answer all questions)

Total Marks = 20 marks

SECTION F

Essay Questions

Discipline Specific Questions D.67 - D.68 = 20 marks

(Answer all questions)

Total Marks = 20 marks

SECTION F

Essay Questions

Discipline Specific Questions D.67 - D.68 = 20 marks

(Answer all questions)

Total Marks = 20 marks

SECTION F

Essay Questions

Discipline Specific Questions D.67 - D.68 = 20 marks

(Answer all questions)

Total Marks = 20 marks

SECTION F

Essay Questions

Discipline Specific Questions D.67 - D.68 = 20 marks

(Answer all questions)

Total Marks = 20 marks

D.67 In essay format, describe minimum labelling requirements and the procedure for handling unlabelled irreplaceable specimens. In your answer include three different examples of these types of irreplaceable specimens. (D. 67: 10 marks)

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D.68 Quality and patient safety are important motivators behind all laboratory procedures. The example below represents errors that happened when laboratory processes were not followed.

Two sisters with similar names, Mrs A and Mrs B had routine smear samples taken on the same day in the same clinic. Unlike Mrs A, Mrs B has been experiencing abdominal pains. When both samples were received in the laboratory, the staff member does not notice that the samples and the request forms were interchanged, and the samples have been processed and resulted.

In essay format, identify the potential harm to the patients in the above example and how it could have been avoided. Discuss the importance of quality and patient safety in a laboratory setting.

(D.68: 10 marks)

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Section F: Total 20 marks

