# AUSTRALIAN INSTITUTE OF MEDICAL AND CLINICAL SCIENTISTS

## AIMS Membership (Multidisciplinary) Examination

## EXAMINATION PACK

**THIS EXAMINATION PACK IS FOR THE AIMS MEMBERSHIP (MULTIDISCIPLINARY) EXAMINATION ONLY**
**AIMS MEMBERSHIP EXAMINATIONS CANNOT BE USED FOR MIGRATION PURPOSES**

**This pack contains:**

- **Guidelines for the AIMS Membership (Multidisciplinary) Examination**
- **Study Guide for the AIMS Membership (Multidisciplinary) Examination**
  - **Major Areas of Knowledge**
  - **Recommended Reading List**
  - **Useful Websites**
- **AIMS Online Remote Proctored Examination Rules**
- **Sample AIMS Membership (Multidisciplinary) Examination Questions**

# AUSTRALIAN INSTITUTE OF MEDICAL AND CLINICAL SCIENTISTS

## Guidelines for the AIMS Membership (Multidisciplinary) Examination

### The AIMS Membership (Multidisciplinary) Examination

The AIMS Membership (Multidisciplinary) Examination is a Multiple-Choice Question (MCQ) paper consisting of 150 single response questions to be completed in three (3) hours. The examination is conducted twice a year in March and September using online remote proctored software. Remote proctoring involves sitting the exam under live supervision using your computer's webcam and your mobile phone in a suitable location with reliable internet connectivity.

The examination is set at the level expected of a professional Medical Laboratory Scientist with at least two (2) years full-time (or part-time equivalent) postgraduate professional experience. Completed examinations are not released under any circumstances.

The examination consists of seven sections covering the following professional disciplines: Anatomical Pathology*, Chemical Pathology*, Molecular Pathology, Haematology*, Immunopathology, Medical Microbiology* and Transfusion Science*. Questions in all sections MUST be attempted and those disciplines asterisked (*) MUST be passed (i.e., at least 50% in **each** discipline) and a pass mark of 50% in either Molecular Pathology or Immunopathology must be achieved. To pass the examination overall 75 questions MUST be answered correctly. The distribution of questions in each professional discipline is indicated below:

| | |
|---|---|
| Anatomical Pathology* | 14 |
| Chemical Pathology* | 30 |
| Molecular Pathology | 16 |
| Haematology* | 30 |
| Immunopathology | 14 |
| Medical Microbiology* | 26 |
| Transfusion Science* | 20 |
| **Total** | **150** |

### Reporting your result

Your result in the examination will be determined using the Rasch measurement framework, a well-established measurement theory implemented by medical councils, colleges and professional bodies around the world. Your result will be expressed as a **scaled score** on a scale from 0 to 1000 with a pass, or cut score set at 500. The scaling of results allows adjustment to be made for any variation in difficulty of questions between disciplines in individual exams as well as any variation in the performance of candidates in different exam sessions. In this way we can ensure that the performance of examination candidates is a true reflection of a candidate's ability to meet a defined standard, irrespective of the mix of questions in an examination or when they sat the exam.

Your result of either **Pass** or **Fail** is based on your overall performance in the exam. If you have failed one or more of the compulsory disciplines you will also be advised of the disciplines in which you have failed. The AIMS Examinations Council does not disclose questions or answers for specific items in the examination you have undertaken.

The facilitator of the examinations and analysis of results is undertaken by an independent organisation, Excel Psychological and Educational Consultancy (EPEC) and all results are reviewed and ratified by the AIMS Examinations Council.

Applicants who are successful in the examination will be classified as a Professional Member of AIMS.

**Please note:** AIMS Membership Examinations are **not for migration purposes**.

## AIMS Membership (Multidisciplinary) Examination Application and Payment Deadlines

You must apply in writing to sit the AIMS Membership (Multidisciplinary) Examination using the application form. The form will be provided to you once your membership application has been processed or you have contacted the AIMS National Office for a review of your eligibility (if your membership application was received more than 3 years ago).

Closing dates to receive the examination application form are:

- 1 December for the **March** Examination
- 10 July for the **September** Examination.

Emailed applications to sit the examination **must** be received no later than 4pm on the specified date.

Following the closing date for applications, you will be registered for the examination and sent a link for payment.

Payment due dates for the examinations are:

- 31 January for the March Examination
- 8 August for the September Examination.

You will receive notification of your: examination date; allocated starting time; instructions regarding your practice test, trial exam, official exam; and detailed instructions on how to install the WebLock secured web browser software. The notification will be sent by the AIMS third party examination service provider to the email address provided on your application form. The notification email will be sent to you by:

- The second week of **February** (for **March** examinations)
- The second week of **August** (for **September** examinations).

If you do not receive your notification by **15 February** (March examination) or **15 August** (September examination), please contact us immediately at exam@aims.org.au.

## Enrolment deferral

A request to defer enrolment to the next examination session must be sent in writing to exam@aims.org.au **prior to the application deadline for the current examination session**. For example, an applicant enrolled in the March examination wishing to defer to the September examination must submit a deferral request prior to the March enrolment deadline (1 December). Requests received after the enrolment deadline will not be accepted.

Once a deferral request has been received, an applicant will be asked to submit a new application form for the next examination session. An applicant must remain an active financial member of AIMS to remain eligible for the Membership Examination.

## English Language Requirement (Membership Examinations)

A comprehensive knowledge of English is essential to the practice of medical laboratory science in Australia. Applicants who provide evidence that they have successfully completed three years of tertiary education in English to obtain one of their tertiary qualifications in one of the following countries are not required to sit an English language test: Australia, Canada (English speaking provinces), Ireland, New Zealand, the UK, or the USA.

All other applicants must obtain one of the following English language test reports issued within the last three (3) years from the date that AIMS receives your examination application:

- International English Language Testing System **(IELTS)** – (Academic or General Training);
- Test of English as a Foreign Language **(TOEFL)**;
- Pearson Test of English Academic **(PTE Academic)** - must be submitted online to the Australian Institute of Medical Scientists. Online submission instructions can be found on the PTE website: pearsonpte.com/scoring;
- Occupational English Test **(OET)** - must be completed in a profession that AIMS considers relevant to medical laboratory science, i.e., Medicine, Nursing, Dentistry, Pharmacy, or Veterinary Science. A copy of your downloaded online *Statement of Results* report must be submitted as a colour scan and submitted online to AIMS. Instructions can found on the OET website;
- **Cambridge C1 Advanced** Test.

The English language requirements align with the Department of Home Affairs requirements for Proficient English. Please refer to the Department of Home Affairs website for the required test scores for each of English Language Tests listed above.

All applicants for the AIMS Membership Examinations must provide certified proof that the above requirements have been met.

## Candidate Identification

Acceptable IDs for the candidates sitting examinations will be as follows:

A. Candidates sitting in Australia or New Zealand will need to provide one of the following:

- Passport or
- Australian / New Zealand Driver's Licence.

B. Candidates sitting overseas will need to provide one of the following:

- Passport or
- Government issued overseas driver's licence (with photo).

## Fees

All Fees are in Australian Dollars (AUD) and are non-refundable. Please see the AIMS website for current fees.

## How to Lodge Your Examination Application

Email your completed examination application form to exam@aims.org.au.

## Checklist

- Complete application form with the declaration signed in ink
- Complete payment information
- Attach evidence of meeting the English proficiency requirement. A PTE or OET test report must be submitted to AIMS in hardcopy and **online**
- Scan and email the application form in PDF file format.

## Results

It will take up to ten (10) weeks to receive your membership examination results letter. Results will be given as a **scaled score** and either a **Pass** or **Fail**. You will also be advised of any compulsory discipline/s you may have failed. Exact marks will not be given.

## Further Information

*Telephone:* +61 7 3876 2988

*Enquiries/Applications:* exam@aims.org.au

*Website:* www.aims.org.au

# AUSTRALIAN INSTITUTE OF MEDICAL AND CLINICAL SCIENTISTS

## Study Guide

## AIMS Membership (Multidisciplinary) Examination

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## Major Areas of Knowledge

The major areas of knowledge expected of candidates are as follows:

### Anatomical Pathology

- Preparation of specimens for light microscopy including fixation and tissue processing, and routine staining for formalin fixed paraffin embedded tissue (FFPE)
- Knowledge of anatomy and physiology with application for specimen triage
- Basic knowledge of normal tissue morphology
- Histochemical methods as applied to light microscopy including special stains and immunohistochemistry
- Fixation, preparation and staining of cytological specimens
- Knowledge of cytology preparations with reference to a range of normal and abnormal presentations.

### Chemical Pathology

A basic understanding of the analytical techniques and methodology behind the measurement of common chemistry analytes and their clinical utility including:

- Basic physiology and pathophysiology of disorders of chemical pathology
- Reagent preparation, concentration and dilution
- Electrolytes, anion gap and osmolarity
- Pre-analytical, analytical and post-analytical causes of error
- Urea, creatinine, and creatinine clearance, uric acid, eGFR
- Glucose, glucose tolerance, HbA1c and use in diabetic and pre-diabetic screening and monitoring
- Liver function tests
- Lipid analysis
- Iron studies and anaemia studies currently undertaken in the core laboratory
- Plasma proteins, protein electrophoresis, and immunofixation
- Specific plasma proteins e.g., CRP, beta 2 microglobulin
- Principles of enzymatic analysis
- Enzyme tests e.g. amylase, creatine kinase
- Calcium, phosphates, magnesium and hormonal control
- Bilirubin including neonatal bilirubin measurement
- Myocardial function tests in relation to the acute coronary syndromes
- Common tumour markers e.g., Prostatic specific antigen, CEA
- Basic serology testing now performed in core laboratory settings such as Hepatitis B, C, and HIV
- Endocrinology such as Thyroid and Adrenal function tests
- Dynamic function testing
- Bioinstrumentation including immunoassays, spectrophotometric assays and Point of Care Testing
- Quality Control concepts as they apply to an automated biochemistry laboratory

- Therapeutic drug monitoring (TDM) and toxicology
- Vitamin assays including Vitamin B12, folate, and Vitamin D.

## Molecular Pathology

- Basic understanding of patterns of inheritance
- Structure of DNA and RNA
- Define terms, including but not limited to; genotype, phenotype, allele, single nucleotide polymorphism, haploinsufficiency, loss of function, gain of function, truncating and non-truncating mutations
- Transcription and translation
- Epigenetics - basic principles of methylation
- Common mutations in constitutional haematological disorders such as alpha and beta thalassaemia, sickle cell anaemia and other haemoglobinopathies, iron overload disorders, haemophilia A and B
- Genetic basis of cancer, including common lymphoid malignancies and myeloproliferative disorders, including but not limited to, Bcr-Abl, BRAF V600E, JAK2 V617F
- Principles of PCR techniques including sample preparation and use of controls
- Principles of PCR; including reverse transcriptase PCR, real-time PCR, multiplex PCR and QPCR
- Sample integrity for DNA and RNA based techniques
- Awareness of the basis of sequencing technologies:
    - Sanger sequencing
    - Massively Parallel sequencing or Next Generation Sequencing (NGS)
    - Long Read Sequencing
- Understanding of the Human Genomic Variation Society (HGVS) and the International System for Human Cytogenomic Nomenclature (ISCN) international standards for nomenclature

## Haematology

- Principles of automated cell counting
- Causes and diagnosis of anaemias
- Benign white cell disorders
- Myeloproliferative disorders
- Lymphoproliferative disorders
- Production of erythrocytes, leucocytes and platelets
- Intrinsic and extrinsic coagulation pathways and methods of testing
- Bleeding and thrombotic disorders
- Anticoagulant therapy and methods of monitoring this therapy
- Natural anticoagulants
- Fibrinolysis
- Malaria testing and species
- Quality control in haematology and coagulation
- Pre-analytical factors in haematology and coagulation.

## Immunopathology

- Basic understanding of the structure and function of the immune system, including primary and secondary immune organs and cells of the immune system
- Adaptive and acquired immune mechanisms
- Cellular and humoral immune responses
- Immunoglobulin properties and functions
- Monoclonal antibodies, their properties and their uses in diagnostics
- Monoclonal gammopathy and its laboratory investigation
- Mechanisms of hypersensitivity and their laboratory investigation
- Acquired and inherited immune deficiency conditions, major autoimmune conditions and their laboratory investigation
- Principles of immunology-based assays e.g., immunophenotyping using flow cytometry, protein electrophoresis and immunofixation, ELISA, nephelometry/turbidimetry, immunofluorescence, chemiluminescence, and enzyme

immunoassay.

## Medical Microbiology

- A basic knowledge of infectious diseases (and associated organisms) commonly diagnosed by analysis of specimens in a routine microbiology laboratory. There will be a greater emphasis on bacterial diseases, but some knowledge of parasitic, fungal and viral disease is also expected.
- Collection, handling and processing of samples including the minimum criteria for acceptance of samples
- Knowledge of normal flora (indigenous flora) of major body sites or absence of normal flora in sterile body sites
- Presumptive identification of major groups of bacteria based on microscopic and colonial morphology on a variety of common media including non-selective, selective / differential and chromogenic media and the use of key basic identification tests such as catalase, oxidase and atmospheric growth requirements
- Principles of major methods of susceptibility testing i.e., disc diffusion, agar dilution and broth dilution and the relationship between breakpoints, MIC and susceptible / resistant categories
- Microscopy: Function and maintenance of a modern binocular microscope, including setting up and using for bright-field, phase-contrast and dark-field microscopy
- Staining techniques: Gram stain and Ziehl-Neelsen stain
- Application of basic molecular techniques for detection, identification of microorganisms / disease markers and detection of important resistance mechanisms
- Basic knowledge of common automation / instrumentation used in routine diagnostic microbiology
- General principles of quality control and quality assurance as it applies to microbiology
- Safety in the microbiology laboratory, Biosafety Cabinets, Biosafety levels.

## Transfusion Science

- Antibody structure and function
- Antigen / antibody interaction
- Antibody production
- Blood donation testing
- Blood components
- Blood group systems
- Antibody detection and identification
- Pre transfusion testing and product selection
- Resolving blood grouping discrepancies
- Haemolytic disease of the foetus and newborn
- Antenatal testing
- Quality assurance in the blood bank laboratory
- Internal quality control and external quality assurance in the blood bank.

## Laboratory Safety and Quality Control

- Safe handling of biological specimens
- Safe handling of hazardous chemicals
- Sterilisation and disinfection procedures
- Handling of infectious specimens

## Principles of quality assurance and quality control

- Basic charting and rules for rejection of results
- Simple statistical evaluation, Reference ranges methodology – parametric and non-parametric
- The role of internal quality control and external quality assurance
- Uncertainty of measurement.

## Basic Laboratory Procedures and equipment

- Normal and Molar solutions
- Basic laboratory calculations
- Basic laboratory equipment and its appropriate use
- Spectrophotometry.

## Recommended Reading List

The most recent edition of texts is recommended, however, recent earlier editions of the texts below from within the last 10 years may be suitable.

### Anatomical Pathology / Cytology

1. Cibas ES and Ducatman BS *Cytology: Diagnostic Principles and Clinical Correlates,* Elsevier
2. Cook DJ and Warren PJ *Cellular Pathology: An Introduction to Techniques and Applications,* Scion Publishing Ltd
3. Eroschenko VP *Atlas of Histology with Functional Correlations,* Wolters Kluwer
4. Suvarna KS, Layton C and Bancroft JD *Bancroft's Theory and Practice of Histological Techniques,* Elsevier
5. Carson FL and Cappellano C (Editors) *Histotechnology: A Self-Instructional Text,* ASCP Press

### Chemical Pathology

6. Bishop ML, Fody EP and Schoeff LE *Clinical Chemistry: Principles Techniques and Correlations*, Jones & Bartlett Learning
7. Marshall WJ, Lapsey M, Day AP and Ayling RM *Clinical Biochemistry metabolic and clinical aspects,* Elsevier
8. Rifai N, Horvath AR and Wittwer CT *Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics,* Elsevier

### Molecular Pathology

9. Buckingham L *Molecular Diagnostics – Fundamentals, Methods and Clinical Applications,* FA Davis
10. Warford A and Presneau N *Fundamentals of Biomedical Science - Molecular Diagnostics*, Oxford University Press

### Haematology

11. Bain BJ, Bates I and Laffan MA *Dacie and Lewis Practical Haematology*, Churchill Livingstone, Elsevier
12. Hoffbrand AV and Steensma D *Hoffbrand's Essential Haematology*, John Wiley & Sons
13. Keohane EM, Otto CN and Walenga JM *Rodak's Hematology: Clinical Principles and Applications*, Elsevier
14. Mehta AB and Hoffbrand AV *Haematology at a Glance*, Wiley-Blackwell
15. Rosenberg G *Microscopic Haematology*, Elsevier

### Immunopathology

16. Delves PJ, Martin SJ, Burton DR and Roitt IM *Roitt's Essential Immunology,* Wiley
17. Male D, Stokes Peeble R and Male V *Immunology,* Elsevier
18. Murphy K and Weaver C *Janeway's Immunobiology,* Wiley
19. Punt J, Stranford S, Jones P and Owen JA *Kuby Immunology,* McMillian Science

### Medical Microbiology

20. Carroll KC, Pfaller MA, Karlowski JA, Landry ML, McAdam AJ, Patel R, and Pritt BS (Editors) *Manual of Clinical Microbiology,* Wiley
21. Tille P *Bailey & Scott's Diagnostic Microbiology,* Elsevier Health Sciences (available as an E book)

### Transfusion Science

22. ANZSBT Guidelines for Transfusion and Immunohaematology Laboratory Practice, (can be downloaded from https://anzsbt.org.au (free))
23. Cohn CS, Delaney M, Johnson ST and Katz LM (Editors) *American Association of Blood Banks Technical Manual,* AABB
24. Daniels G and Bromilow I *Essential Guide to Blood Groups*, Wiley
25. Harmening D *Modern Blood Banking & Transfusion Practices*, FA Davis Company

## Useful Websites

Please note: All links were current at the time this document was made available on our website.

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|---|---|---|
| Australian Red Cross **LIFEBLOOD** | https://www.lifeblood.com.au/health-professionals/testing/blood-groups/phenotypes | |
| BloodSafe eLearning Australia | https://bloodsafelearning.org.au/ | |
| ANZSBT | https://anzsbt.org.au/ | |
| ISBT | https://www.isbtweb.org/ | |
| National Blood Authority | https://www.blood.gov.au/clinical-guidance/patient-blood-management/patient-blood-management-pbm-resources | |
| The Blood Bank Guy | https://www.bbguy.org/ | |
| Centers for Disease Control and Prevention | www.cdc.gov<br>https://www.cdc.gov/dpdx/reference.html<br>https://www.cdc.gov/lab-training/php/courses/basic-molecular-biology-elearning-series.html?CDC_AAref_Val=https://www.cdc.gov/labtraining/training-courses/basic-molecular-biology/index.html | Excellent site for all things microbiological.<br>Excellent site dealing with parasitology.<br>Basic Molecular Biology eLearning Series. |
| Mycology online | www.mycology.adelaide.edu.au | Excellent Australian site dealing with fungi. |
| EUCAST | www.eucast.org | Antimicrobial susceptibility testing (European) in use in Australia |
| CLSI | https://clsi.org/resources/ | Antimicrobial susceptibility testing (US) |
| Pathology Tests Explained | https://pathologytestsexplained.org.au/ | Produced by the AACB in collaboration with AACC and RCPA. This site offers up-to-date information about laboratory tests and how they are used. |
| Pathology Tests Explained – Reference Ranges | https://pathologytestsexplained.org.au/understanding/overview-of-reference-intervals | Candidates should be familiar with the role and purpose of reference intervals, how they are determined and changes that can occur due to age and gender etc. |
| RCPA | https://www.rcpa.edu.au/Library | |
| Communicable Diseases Intelligence | https://www1.health.gov.au/internet/main/publishing.nsf/Content/cda-pubs-cdi-cdicur.htm | Information about epidemiology and control of communicable disease in Australia |
| AIMS | www.aims.org.au | |
| American Society for Microbiology | www.asm.org | Useful content. Subscription access to **current journals.** Older content may be free. |
| ASM (Australia) | www.theasm.org.au | Password required for some content |
| NATA | https://www.nata.com.au/ | Laboratory policy and requirements |
| NPAAC | https://www.safetyandquality.gov.au/our-work/accreditation/pathology-accreditation-standards | NPAAC Guidelines |
| AACB | https://www.aacb.asn.au/ | Member access required for full access. Open access to some very useful material |
| Association for Diagnostics & Laboratory Medicine (Formerly AACC) | https://www.myadlm.org/ | Member access required for full access. Open access to some very useful material |
| Association for Molecular Pathology | https://www.amp.org/ | Useful site providing information on recent developments in molecular diagnostics |
| Haematology | https://www.sciencedirect.com/journal/seminars-in-hematology *(copy and paste link)* | Seminars in Haematology journal |
| Haematology | https://www.sciencedirect.com/journal/experimental-hematology *(copy and paste link)* | Experimental Haematology journal |
| Haematology | http://digital.haematologica.org/wp-content/uploads/flipbook/48/book.html | Haematologica Atlas of Hematologic Cytology |

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|---|---|---|
| Haematology | https://microscopic-haematology.com/ | Microscopic Haematology - Gillian Rozenberg |
| Haematology | https://www.amboss.com/us/knowledge/Basics_of_hematology/ | Basics of Haematology |
| Histology at the University of Michigan | https://histology.medicine.umich.edu/ | This digital microscopy resource for the study of cells, tissues and organs. A full list of virtual slides and a full list of virtual EM micrographs are also available |
| T. Clark Brelje and Robert L. Sorenson | https://histologyguide.com/ | A Guide to Microscopic Structure of Cells, Tissues and Organs |
| Human Genomic Variation Society (HGVS) | https://hgvs-nomenclature.org/stable | |
| International System for Human Cytogenomic Nomenclature (ISCN) | https://iscn.karger.com | |

# AUSTRALIAN INSTITUTE OF MEDICAL AND CLINICAL SCIENTISTS

## Online Remote Proctored Examination Rules

1. The candidate will be monitored in real time by an online proctor, employed by the third party examination service provider, to detect any evidence of academic misconduct.
2. The candidate must complete one (1) practice test (at any time of their choosing) before they sit a trial examination.
    - The intent of the practice test is to give the candidate the opportunity to verify they have successfully installed the WebLock secured browser and to become familiar with the online examination interface.
3. The candidate must complete one (1) trial examination within two (2) weeks prior to sitting for the official examination.
    - The intent of the trial examination is to take the candidate through the process of doing the examination online with the supervision of a remote proctor.
    - Failure to complete the trial examination may disqualify the candidate from sitting the official examination.
4. The questions in the practice test and the trial examination are a **small** selection from the same **example questions** that can be found in this Examination Pack and will not be scored and will not be used in the candidate's assessment results.
5. The candidate must do their practice test, trial examination and the official examination on the **same computer** that they have installed the WebLock secured browser.
6. Candidates are required to type their answers in English.
7. Whilst the online examination interface continuously captures the candidate's answers as the candidate progresses through the examination, the candidate must submit their examination before the end of the three (3) hour examination period.
8. During the examination period, the candidate will be able to review and modify their answers before they submit their examination.
9. During the examination, the examination interface will indicate the time remaining.
10. The candidate MUST show a photo ID (passport or driver's license) to the remote proctor before commencing the trial and official examinations.
11. No headphones can be used during the examination.
12. The candidate must **not** have in their room any books, dictionaries, notes or other documents.
13. The candidate must **not** have in their room devices except for those authorised by the remote proctor.
14. No person other than the candidate is permitted in the room at any time during the examination.
15. No bathroom or rest breaks are allowed during the examination unless a candidate has **applied** for approved special consideration due to a disability or medical condition.
16. A blank sheet of paper and a pen is allowed on the candidate's desk for workings only.
17. The candidate must remove any smart watches, jewellery, scarfs (not including religious headwear), caps and hats.
18. A calculator will **not** be required for the examination. The examination may include simple arithmetic calculations.
19. Academic misconduct may include any of the following activities:
    - Copying material from other sources and presenting it as their own work.
    - Impersonating a registered candidate.
    - Collaborating with another person when completing the online examination as it must be the candidates own work.

- Unauthorised access to examination questions or related material before or after the examination.
- A failure to follow the rules of the examination that gives the candidate an advantage.
- **Inappropriate** use of a mobile phone, other electronic devices including smart watches, electronic calculators, iPads, tablets.

20. Examination answers should reflect the candidate's own work.
21. Plagiarism detection software will be used to monitor candidate examination papers submitted for review.
22. No candidate shall in any way give assistance to, or receive assistance from, any other person before, during, or after the examination.
23. The candidate will be recorded via video if the remote proctor believes there is an incident of misconduct. If the incident continues after a warning, the candidate's examination will be cancelled and the incident reported to AIMS.
24. Misconduct in examinations shall be reported in writing by the remote proctor to AIMS, and AIMS will conduct an investigation.
25. A candidate who is found to be guilty of misconduct in an examination may have their examination paper declared null and void.
26. Candidates will be expected to start their examination at the time allocated by the examination service provider.
27. If a candidate believes there was an error in a question, then they should report it to AIMS within five (5) business days after they have completed their online examination.
28. Candidates who have a disability and / or medical condition and who may require special examination requirements can apply in writing to AIMS for a determination. A certificate from the candidate's medical doctor must be submitted with the application for special examination requirements. The medical doctor's certificate must justify the special examination requirement and describe the special examination needed. Special examination requirements may include:
    - A candidate is given additional writing time depending on the level of their disability. The additional time will be automatically added to their exam duration by the exam service provider.
    - A candidate is given approved rest breaks. The additional time for the rest breaks will be added to their exam duration by the exam service provider.
29. Candidates must submit their written application for special examination requirements no later than three (3) weeks prior to the date of the examination. The application may be submitted as an attachment to an email.
30. Candidates who have been significantly affected by ill health or other serious circumstances just prior to taking the exam may be eligible to apply for *special consideration*. Special consideration is a post-examination adjustment that compensates candidates who were suffering from a temporary illness or condition or who were otherwise disadvantaged at the time of the examination.
31. An application for *special consideration* will only be considered if on the day of the examination or just prior to taking the examination:
    - The candidate was adversely affected to a substantial degree by illness or other cause, and / or
    - The circumstances were beyond the candidate's control.
32. Examples of ill health: the candidate is hospitalised, or the candidate has a life threatening disease.
33. Example of a serious circumstance: there has been a death in the candidate's **immediate** family.
34. Missing examinations: Candidates are strongly advised to attend their designated examination unless the candidate is physically incapable of doing so. Missing an examination does not automatically entitle the candidate to a *special consideration*.
35. Candidates must submit their written application for *special consideration* no later than three (3) working days after the date of the examination. The application may be submitted as an attachment to an email.
36. The candidate has five (5) working days from when they lodge their application for *special consideration* in which to submit supporting documents from an appropriate professional. Applications lodged without supporting documentation will not be considered.
37. The supporting documentation for *special consideration* due to ill health must be a certificate written by the candidate's medical doctor. The certificate must state that the candidate was physically incapable of completing the examination on the designated day of the examination.

38. The supporting documentation for *special consideration* due to serious circumstances includes the following:
    - letter from a social worker, lawyer, or psychologist
    - death notice or certificate and evidence of relationship
    - police report
    - statutory declarations from relevant people
    - notification from:
        - defence services
        - Juries Commissioner's Office
        - emergency service organisations such as the Country Fire Authority.
39. Candidates must ensure that they are familiar with the AIMS Code of Professional Conduct.
40. Academic misconduct in examinations is a prohibited activity and would contravene the AIMS Code of Professional Conduct.

# AUSTRALIAN INSTITUTE OF MEDICAL AND CLINICAL SCIENTISTS

## AIMS Membership (Multidisciplinary) Examination - Sample Questions

**PLEASE NOTE THESE QUESTIONS ARE FOR GUIDANCE ONLY**

**NO FURTHER SAMPLE QUESTIONS WILL BE PROVIDED BY AIMS**

### Anatomical Pathology

1. The standard routine stain for histology morphology is the?

   a) PAS stain
   b) H & E stain
   c) Trichrome stain
   d) Van Gieson's stain

2. Acid fast bacteria are suitably demonstrated with the?

   a) Periodic acid Schiff reaction
   b) Rhodanine stain
   c) Ziehl-Neelsen stain
   d) Perls' Prussian blue reaction

3. Suitable tissue control material for immunohistochemistry to demonstrate hepatic specific antigen is?

   a) Skin Tissue
   b) Thyroid Tissue
   c) Liver Tissue
   d) Pancreatic Tissue

4. The correct descending anatomical order for the specimen series is:

   a) Oesophagus, duodenum, caecum, ileum
   b) Oesophagus, antrum, jejunum, rectum
   c) Jejunum, ileum, caecum, rectum
   d) Fundus, jejunum, ileum, rectum

5. What would you expect to see in the cytological morphology of a squamous cell carcinoma:

   a) Keratinisation
   b) Mucin
   c) Vacuolisation
   d) Pseudostratified columnar epithelium

## Chemical Pathology

1. Which sample type would you use to measure glucose?

    a) Centrifuged EDTA plasma
    b) Centrifuged Sodium citrate plasma
    c) Lithium heparin plasma centrifuged 4 hours post collection
    d) Fluoride oxalate plasma

2. Pseudohyponatremia can be caused by which of the following:

    a) High glucose concentrations
    b) Low platelet counts
    c) High concentration of serum lipids
    d) High concentrations of ADH

3. Beer Lambert's law gives the relation between which of the following?

    a) Energy absorption and reflected radiation
    b) Energy absorption and concentration
    c) Scattered radiation and concentration
    d) Reflected radiation and concentration

4. What is the CV or Coefficient of Variation?

    a) SD / Mean x 100
    b) Mean / SD
    c) $\sigma 2 = \Sigma ( Xi - X )2 / N$
    d) $\Sigma ( X ) / N$

5. Aldosterone is produced by which tissue?

    a) The adrenal medulla
    b) The adrenal cortex
    c) The Pituitary gland
    d) Juxtaglomerular apparatus (Kidney)

## Haematology

1. What does a d-Dimer measure?

    a) Platelets
    b) Thrombin
    c) Factor VIII
    d) Fibrin degradation products

2. The International Normalised Ratio is calculated by?

    a) The APTT of the patient and a normal control
    b) The ISI of the reagent and the PT result of the patient and a control
    c) The PT and the TCT
    d) PT of the patient divided by the mean normal PT

3. A patient taking aspirin is most likely to show an abnormal result in which of the following tests?

    a) Prothrombin Time (PT)
    b) Activated Partial Thromboplastin Time (APPT)
    c) Total platelet count
    d) Platelet aggregation test

4. What is the characteristic finding seen in the peripheral blood smear of a patient with iron deficiency?

a) Microcytic hypochromic red cells
b) Intracellular inclusion bodies
c) Rouleaux
d) Hyper-segmented neutrophils

5. Pelger-Huet anomaly is characterised by?

a) Hyper-segmented neutrophil nucleus
b) Toxic granulation of the cytoplasm
c) Bilobed nucleus with dense pyknotic chromatin pattern
d) Giant granules in the cytoplasm

## Medical Microbiology

1. What does a high squamous epithelial cell count indicate in microscopy of a mid-stream urine?

a) An infection is probably present
b) The specimen may contain vaginal contamination
c) The squamous cell count is not relevant
d) The specimen has not been stored correctly after collection

2. In a diagnostic laboratory, what is the most common use for a matrix assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) instrument?

a) Susceptibility testing
b) Bacterial identification
c) Blood culture bottle processing
d) Automated urine cell counting

3. A Class II Biosafety Cabinet is often used in microbiology laboratories to?

a) Protect both the operator and sample from contamination
b) Protect sterile samples only from contamination
c) Protect the operator only from exposure to pathogens
d) Store hazardous chemicals

4. Which fungi are commonly associated with tinea?

a) *Aspergillus flavus*
b) *Microsporum canis*
c) *Exophiala dermatitidis*
d) *Candida tropicalis*

5. A small gram-positive bacillus is isolated from blood cultures collected from an immunocompromised elderly man. The isolate is catalase positive, shows tumbling motility, shows a small zone of beta haemolysis and is Hippurate positive. What is the likely identification?

a) *Corynebacterium diphtheriae*
b) *Erysipelothrix rhusiopathiae*
c) *Listeria monocytogenes*
d) *Streptococcus agalactiae*

## Transfusion Science

1. A blood donor has the genotype hh, AB. What would be their red cell phenotype?

a) A
b) B
c) 0
d) AB

2. A 19-year-old woman of European ethnicity presents to a mobile blood drive at her university. She fulfils all eligibility criteria and donates a unit of whole blood. The results of her ABO and Rh typing is shown in the table below.

Forward typing | Reverse typing

| Anti-A | Anti-B | Anti-A, B | Anti-D | Weak D test | Weak D Control | A1 cells | B cells |
|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 2+ | 0 | 4+ | 4+ |

Components generated from the donation should be labelled as?

a) Group A, RhD negative
b) Group O, RhD positive
c) Group O, weak D
d) Group A, RhD positive

3. A patient's red cells react with anti-A and the serum / plasma reacts with group B red cells. The ABO blood group identification is?

a) A
b) B
c) O
d) AB

4. The reactivity of which of the following antibodies is usually enhanced by the enzyme treatment of red cells?

a) Anti-D
b) Anti-Fy$^{a}$
c) Anti-M
d) Anti-S

5. In Australia, samples collected for pretransfusion testing are required to meet at a minimum, which of the following labelling criteria?

a) Label contains the patients surname and date of birth
b) Label contains the patients full name, date of birth, sample collection date and time and phlebotomists signature
c) Label contains the patients full name, date of birth, hospital number and phlebotomists signature
d) Label contains the patients full name, date of birth, and sample collection date and time

## Immunopathology

1. The thymus has which of the following properties?

a) It is a site of haemopoiesis
b) It is a site of B cell maturation
c) It is a site of T cell maturation
d) It is a site of dendritic cell maturation

2. A decrease in the circulating level of C3 and C4 is most likely to be seen in which of the following clinical conditions?

a) Fungal infection
b) Autoimmune disease such as SLE
c) Tumours of the central nervous system
d) Agammaglobulinemia

3. Increased cellular infiltrates of which of the following cells is characteristic of chronic inflammation?

    a) Lymphocytes
    b) Macrophages
    c) Basophils
    d) Neutrophils

4. An important function of dendritic cells is?

    a) Antigen presentation to T helper cells
    b) Antigen presentation to Tc cells
    c) Secreting cytokines that promote haematopoiesis
    d) Initiating an acute inflammatory response

5. CD8 positive T cells are important in immune responses to?

    a) Bacterial infections
    b) Viral infections
    c) Fungal infections
    d) Parasitic infections

## Molecular Pathology

1. Which of the following anticoagulants is NOT advised for use with samples collected for PCR assays?

    a) Heparin
    b) EDTA
    c) Oxalate
    d) ACD

2. The sequence of temperatures used in a standard PCR technique is typically?

    a) 70C, 60C, 95C
    b) 60C, 95C, 70C
    c) 95C, 70C, 60C
    d) 95C, 60C, 70C

3. The Ph chromosome is an example of a?

    a) Reciprocal translocation
    b) Deletion
    c) Inversion
    d) Robertsonian translocation

4. The human genome has approximately _____ genes?

    a) 12,000
    b) 22,000
    c) 32,000
    d) 42,000

5. The enzyme that extends the primers in a PCR reaction is a?

    a) Polymerase
    b) Kinase
    c) Transferase
    d) Helicase