AUSTRALIAN INSTITUTE OF MEDICAL SCIENTISTS
FELLOWSHIP EXAMINATION

IMMUNOLOGY

Compulsory Module Immunology I
Principles of Human Immunology

Candidate Name

Time permitted three hours

INSTRUCTIONS TO CANDIDATE
Answers should be written in the answer book provided, writing on the right hand page only. The facing page may be used for rough work if desired.

The examination consists of:
• 10 short answer questions (approximately 5 minutes each – total 50 minutes)
• 5 essay style questions of which 4 must be answered (approximately 25 minutes each – total 100 minutes)

The remaining time of the examination period should be devoted to carefully reviewing the questions and your responses.

No papers or books of any kind may be taken into the examination room. A non-programmable calculator only is permitted.

The examination paper may not be removed from the examination room.
PART A SHORT ANSWER QUESTIONS

There are 10 questions. ALL questions must be answered. Time allocated to each question should not exceed 5 minutes. Each question is worth 10 marks.

A1 The lymphoid system is comprised of primary and secondary lymphoid organs. Briefly describe the processes which occur in:
   (i) Primary Lymphoid Organs (5 marks)
   (ii) Secondary Lymphoid Organs (5 marks)

A2 Provide a brief summary of the role of the innate immune system in defense against invading pathogens (10 marks)

A3 List the key characteristics of an acquired (adaptive) immune response (10 marks)

A4 Briefly outline the immunological processes involved in the establishment of immune memory (10 marks)

A5 List the roles of complement in immune defense (10 marks)

A6 The uncontrolled activation of complement is deleterious. How is complement activity regulated normally (10 marks)

A7 Why is immune tolerance important for survival of the individual? (10 marks)

A8 What is the difference between central and peripheral T-lymphocyte tolerance? (10 marks)

A9 List the major components of immune defense at mucosal sites (10 marks)

A10 How is IgA secreted across mucosal surfaces? (10 marks)
AIMS Fellowship Examination
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PART B ESSAY STYLE QUESTIONS
There are 5 questions.

ANSWER ONLY FOUR (4) QUESTIONS.
Time allocated to each question should not exceed 25 minutes. Each question is worth 25 marks.

B1 Describe the mechanisms for antigen processing and presentation via MHC class I and class II molecules to T lymphocytes. How do these different pathways lead to appropriate defences against different types of microorganisms? (25 marks)

B2 Outline the immune response observed following primary and booster immunization 1 month later with tetanus toxoid. Include in your answer a comment on what you consider to be a protective immune response against tetanus. (25 marks)

B3 There are three complement pathways – classical, alternative and lectin. How are these different pathways activated? (25 marks)

B4 In the normal healthy person, how is tolerance against self antigens and cross reacting antigens maintained? (25 marks)

B5 Describe the immunological responses to a bacterial pathogen which has infected a mucosal surface. (25 marks)