Australian Institute of
Medical and Clinical Scientists (AIMS)

FELLOWSHIP EXAMINATION EXAMPLE

Name:
Candidate No:

Immunology

Compulsory Module I
(Principles of Human Immunology)

SAMPLE EXAM

INSTRUCTIONS TO CANDIDATE

Time allowed is three (3) hours

Answers should be written in the answer book provided, writing on the right-hand page only leaving the margin blank. The facing page may be used for rough work if desired

The examination consists of:
- 2 essay style questions; each question is worth 35 marks.
  (Allow approximately 30 mins each)
- 20 short answer questions; each question is worth 5 marks.

Time allowed for writing is three (3) hours. There is an additional initial reading time of 15 minutes during which notes only may be written on the examination paper but no writing in the examination answer books is permitted at this time.
Candidates may attempt either the essay questions or the short answer questions first.

No papers or books of any kind may be taken into the examination room. No electronic devices of any type* are to be taken in to or accessed in the examination room. A non-programmable calculator only is permitted.

*This includes, but is not restricted to: phones, iPads, iPods, eBook readers, MP3 players, memory sticks (flash drives) and WiFi enabled devices of all types.

THE EXAMINATION PAPER MAY NOT BE REMOVED FROM THE EXAMINATION ROOM

ESSAY ANSWER QUESTIONS

2 Questions - each question is worth 35 marks. Time allocated to each question should not exceed 35 minutes. All questions should be attempted

Q1. Provide an outline of the major functions of innate immunity. Include in your answer the interrelationship between innate immunity and acquired immunity.

Q2. Outline the cellular and molecular interactions that occur in the generation of an antibody response. Include in your answer the concept of T cell dependent and T cell independent antigens and the antibody response stimulated by these antigens.

SHORT ANSWER QUESTIONS

20 Questions - each question is worth 5 marks. Time allocated to each question should not exceed 5 minutes. All questions should be attempted

Q1. List the key physical and chemical barriers of innate immunity.

Q2. What are the 2 major functions of secondary lymphoid organs?

Q3. What is the role of NK cells in protection against virus-infected cells?

Q4. Briefly describe the ontogeny (developmental) profile of the acquired immune system in the
first year of life.

Q5. What are the key factors that drive the differentiation of pluripotent haemopoietic stem cells?

Q6. What cells can act as antigen presenting cells and how is antigen taken up by these cells?

Q7. What are the mechanisms for antigen presentation via MHC class 1 molecules to T lymphocytes?

Q8. Briefly describe the immunological processes involved in the establishment of immune memory.

Q9. How are CD4+ T cells activated?

Q10. List 3 signature cytokines for TH_2 cells. What cells do these cytokines act on and what effects do they have on these cells?

Q11. How are CD8+ T cells activated and what is their function?

Q12. Describe the immunological basis for the development of conjugate (protein-polysaccharide) vaccines for use in young children.

Q13. How is complement activated through the lectin pathway? Give an example of when this may occur.

Q14. What are the major biological outcomes generated by complement activation?

Q15. Why is immune tolerance important for survival of the individual?

Q16. Briefly explain the concept of central tolerance.

Q17. Briefly describe the immunological mechanisms for oral tolerance.

Q18. How is self-tolerance maintained?

Q19. Why is it important for lymphocytes to circulate within the mucosal immune system and what molecules do they possess which enables them to do this?

Q20. How is IgA secreted across mucosal surfaces?

END OF EXAMINATION