



The Royal College of **Pathologists**
Pathology: the science behind the cure

Part 1 examination

Histocompatibility and Immunogenetics: First paper

Autumn 2020

Candidates must answer FOUR questions ONLY

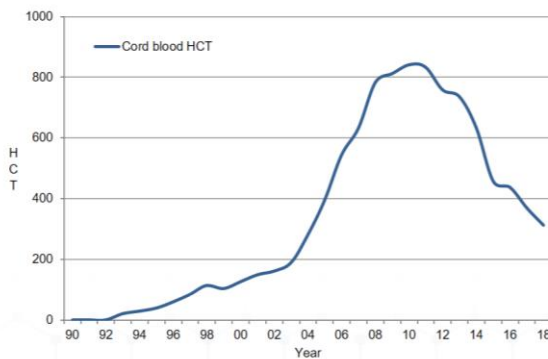
Time allowed: Three hours

Section A – Answer TWO out of the following three questions

1. Describe the role of the H&I laboratory in supporting a transfusion service; what conditions/reactions may require H&I involvement and what testing is required for these?
2. Discuss the benefits and risks associated with the introduction of a virtual crossmatch procedure and the mitigation you would introduce, for HLA sensitised patients receiving kidneys from deceased donor.
3. The European Society for Blood and Bone Marrow Transplantation reports annual activity for HSCT in Europe. Propose likely reasons for the trends depicted in the graph below for the use of cord blood and discuss the future of cord blood as a source of stem cells for transplantation.



**HCT activity in Europe 1990-2018:
Cord blood HCT: all transplants**



EBMT Activity Survey

Section B – Answer TWO out of the following three questions

4. Write short notes on the following targets of non-HLA antibodies and discuss the evidence for their clinical relevance if present at the time of kidney transplant
 - a) MICA
 - b) ATII type 1-R
 - c) HNA-3a
5. Write short notes on the importance and contribution the following make to the provision of an H&I service
 - a) Internal Audits
 - b) Incident investigation

c) Risk management

d) Business Continuity / Emergency Contingency Planning

6. Write short notes describing the influence of HLA typing in the clinical management of the following conditions:

a) Abacavir hypersensitivity

b) Coeliac Disease

c) Ankylosing spondylitis

d) Diabetes



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FRCPath Part 1 Histocompatibility & Immunogenetics Autumn 2021
Paper 1: Essays and short notes

Section A: Essay questions

1. Describe the methods that can be used to monitor Chimerism after HSCT? Outline how the information may be used clinically.
2. Discuss the role of antibody removal in renal transplantation. Critically appraise this approach for transplantation compared to the national kidney sharing scheme.
3. It is well established that immunity can be broadly divided into innate and adaptive immunity. Define and compare these two types of immunity.

Section B: Short notes

1. In the context of renal transplantation, write short notes on the importance of:
 - a. HLA matching
 - b. IgM HLA antibodies
 - c. HLA-DP antibodies
 - d. Non-HLA antibodies
2. Write short notes on:
 - a. Natural Killer KIR nomenclature using KIR2DL1*0030202 as an example
 - b. KIR 'A' and 'B' haplotypes
 - c. KIR ligands present on HLA class I proteins
3. In relation to blood transfusion:
 - a. Describe TWO immunological reactions induced by platelets transfusion and indicate the main antigenic systems and antibodies involved.
 - b. What tests are available to aid their diagnosis?
 - c. How can these immunological reactions be prevented?

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Paper 1: Essays and short notes

ESSAY QUESTIONS

Answer TWO out of the following three questions

1. Describe the mechanisms behind Graft versus Leukaemia and Graft versus Host Disease and how you would balance and monitor the two mechanisms in a post-transplant AML patient.
2. Describe the mechanisms for central and peripheral tolerance and their role in the immune system. Briefly outline ways of promoting tolerance in the solid organ transplant setting.
3. Discuss innovative approaches using **molecular matching** tools to improve solid organ transplant (SOT) outcomes.

SHORT NOTES QUESTIONS

Answer TWO out of the following three questions

1. In the context of post-transplant monitoring, write short notes on the use and value of the following:
 - a. Donor derived cell free DNA (dd cfDNA) in kidney transplantation
 - b. Digital PCR technology for detection of chimerism post HSCT
 - c. MicroRNAs as biomarkers in kidney transplantation
2. Write short notes on the key features of the allocation schemes for deceased:
 - a. Kidneys
 - b. Hearts
 - c. Pancreata
3. Write short notes on the importance and contribution the following make to the provision of an H&I service giving examples:
 - a. Change Management
 - b. Business Continuity
 - c. Internal Quality Control Data
 - d. Key Performance Indicators