Hematology Exam 2

1. Which one of the following statements is LEAST TRUE of haematology
(a) It involves the study of blood, blood forming organs and blood diseases
(b) It overlaps with the subspecialty of medical oncology
(c) It involves the study of aetiology, diagnosis and treatment of immunodeficiency
(d) Much of it involves laboratory analyses of blood done by medical technologists

2. A test done to measure the resistance of erythrocytes to haemolytic breakdown is called
(a) Mean corpuscular rupture test
(b) Osmotic fragility test
(c) Erythrocyte sedimentation test
(d) Red blood cell distribution width

3. Which disease is characterised by excessive build-up of relatively mature but still normal white blood cells
(a) Acute leukaemia
(b) Extranodal lymphoma
(c) Benard-Soulier syndrome
(d) Chronic leukaemia

4. Select a word which is CORRECTLY matched with its description
(a) Erythrocytopenia – an increase in the number of erythrocytes beyond the optimum level
(b) Anoxemia – above normal proportions of oxygen in the blood
(c) Angiogenesis – growth of new blood vessels from pre-existing ones
(d) Transfusion reaction – destruction of the recipient's red blood cells after blood transfusion

5. Haemoglobin carries some of the body's CO2 as
(a) Carbaminohaemoglobin
(b) Oxyhaemoglobin
(c) A Bicarbonate
(d) A Carbonate

6. Select an event which is NOT among the major processes involved in hemostasis
(a) Vasoconstriction
(b) Fibrinolysis
(c) Platelet plug formation
(d) Thrombosis

7. The platelet disorder that causes the development of abnormally large platelets and is linked to a mutation in the MYH9 gene is called
(a) May – Hegglin anomaly
(b) Von Willebrand disease
(c) Gray platelet syndrome
(d) Glanzmann's thrombasthenia

8. The erythrocyte sedimentation rate
(a) Measures the rate at which blood sediments over a period of three hours
(b) Is measured by placing coagulated blood in a Westergren tube
(c) Can nowadays be measured by the use of an automated analyser
(d) Is also called the haematocrit estimation test

9. Which one of the following statements is UNTRUE concerning the events that occur during hepatic period of haematopoietic development
(a) Definitive erythropoiesis takes place and all developmental red cell stages are present
(b) Haematopoietic activity commences in the lymph nodes and thymus
(c) The liver reaches its peak in erythropoiesis and granulopoiesis
(d) It produces the haemoglobin variants FA1, A2, Gower 1 and Gower 2

10. All the following are the main bone marrow components with cell – anchoring functions EXCEPT
(a) Stromal cells
(b) Osteoblasts
(c) Red marrow cells
(d) Endothelial cells

11. Identify a FALSE statement on the multitotipotent haematopoietic stem cells (MTHSCs)
(a) Cytokines can inhibit their apoptosis
(b) They can produce up to 1.5 billion granulocytes per kilogram of body weight daily
(c) They are capable of cell renewal and differentiation into progenitors cells
(d) They are morphologically similar to small dendritic cells

12. Select a characteristic that is NOT shared by cytokines
(a) Exhibition of multiple biologic activity
(b) Synergistic action
(c) The ability to form interacting systems without amplification potential
(d) The production of maximum effects even at very low concentrations

13. Select a CORRECT terminal sequential order among the following haematopoietic components
(a) Metamyelocyte, promyelocyte, myelocyte, band neutrophil, neutrophil
(b) Megakaryoblast, promegakaryocyte, megakaryocyte, platelets
(c) Promonocyte, monocyte, monoblast, macrophage
(d) T lymphoblast, prothymocyte, thymocyte, committed T cell

14. The glycoprotein most commonly implicated in athletic blood doping is
(a) Folic acid
(b) Thrombopoietin
(c) Kit ligand
(d) Erythropoietin

15. The following factors can cause decreased membrane surface area in hereditary spherocytosis EXCEPT
(a) Defects in ankyrin
(b) Defects in band 3

(c) Deficiency in hepcidin
(d) Deficiency in protein 4.2

16. Identify a cellular product that DOES NOT arise from the common myeloid progenitor
(a) Neutrophils
(b) Natural Killer (NK) cells
(c) Megakaryocyte
(d) Monocytes

17. Select a substance that DOES NOT contribute towards the endothelial cells' hemostatic role of prevention of blood clotting and platelet aggregation
(a) Endocyclin
(b) Thrombomodulin
(c) Nitric oxide
(d) Prostacyclin

18. Which cell type CORRECTLY matched with its role in the human body
(a) Dendritic cells – target virus infected and tumorigenic cells
(b) Basophils – present antigens to T cells leading to their activation
(c) Eosinophils – secrete antibodies for humoral defense
(d) Neutrophils – phagocytose foreign agents in acute inflammation

19. The largest fraction of the plasma protein component is composed of
(a) Albumins
(b) Immunoglobulins
(c) Serum lipoproteins
(d) Alpha 1 antitrypsin

20. Identify a cytokine / growth factor that is LEAST IMPORTANT in erythropoiesis among the following
(a) GM-CSF
(b) IGIF-1
(c) Interferon Gamma
(d) Kit ligand

SECTION B: SHORT ANSWER QUESTIONS [40 MARKS]
1. Define haematopoiesis, and describe the events that take place during the mesoblastic period of haematopoietic development (4 marks)
2. Describe two types of anaemia as a group of haematopoietic disorders
(4 marks)
3. Classify the lymphomas as adopted in the WHO 2008 lymphoma classification system
(4 marks)
4. Explain the what is meant by the erythrocyte sedimentation rate and how it is measure
(4 marks)

5. State and define four red cell indices
(4 marks)

6. Outline the characteristics shared by interleukins involved in regulation of haematopoiesis (4 marks)

7. Explain how progenitor cell commitment to T cell lineage is directed in the thymus (4 marks)

8. Identify any 4 angiogenic stimulator proteins (2 marks)

9. Identify the phospholipid components of the outer inner leaflets of the RBC lipid bilayer (2 marks)

10. Distinguish between the following;

(a) Primary and secondary fibrinolysis (2 marks)

(b) Vasculogenesis and interssusception
(2 marks)

(d) Angiogenesis and cicatrisation
(2 marks)

(e) Apoptosis and hemostasis (2 marks)

SECTION C: LONG ANSWER QUESTIONS [40 MARKS]

1. With the aid of diagrams, discuss the occurrences in leucopoiesis
(20 marks)

2. Discuss the neoplastic disorders (lymphoma and leukaemia) of the haematopoietic system (20 marks)