

HLS Midterm (2012-2013)

1. Which of the following cells increase in level during allergic reactions?

- (a) Neutrophils
 - (b) Basophils
 - (c) Eosinophils**
 - (d) Lymphocytes
 - (e) Monocytes
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2. Which of the following is the correct pathway when one lymph node sends a lymphocyte to educate another lymph node about antigenic stimulation?

- (a) Post-capillary venules → Thoracic duct → Systemic Circulation → Efferent lymphatic vessel
 - (b) Afferent lymphatic vessel → Post-capillary venules → Efferent lymphatic vessel
 - (c) Afferent lymphatic vessel → Thoracic duct → Systemic Circulation → Efferent lymphatic vessel
 - (d) Afferent lymphatic vessel → Thoracic duct → Efferent lymphatic vessel
 - (e) Efferent lymphatic vessel → Thoracic duct → Systemic Circulation → Post-capillary venules**
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3. Which of the following is NOT true of neutrophilia?

- (a) Neutrophilia is not always associated with an increased production of neutrophils
 - (b) Apparent neutrophilia results in the migration of neutrophils from the marginating compartment to the circulating one.
 - (c) Intense muscular exercise increases the number of neutrophils for many days.**
 - (d) Band cells and metamyelocytes can be seen sometimes in certain bacterial infections
 - (e) Glucocorticoids increase the mitotic activity and result in increased production of neutrophils
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4. Which of the following statements is NOT CORRECT? (NOT SURE OF ANSWER)

- (a) Dendritic cells trap antigens on their surface and present them to T or B cells
 - (b) Interdigitating dendritic cells are found in the thymus-dependant zones of the lymph nodes and spleen
 - (c) Follicular dendritic cells can present an antigen not associated with MHC to a B cell
 - (d) The first cells to be activated in a secondary immune response are memory B cells
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5. Removal of the old and aged erythrocytes from the circulation:

(a) Is due to the dilated endothelium and large pores in the lining of the sinusoids of the spleen

(b) Takes place in the marginal zone sinuses

(c) Occurs in the lymph node

(d) Is the function of splenic cords

(e) A + B

6. All of the following regarding T lymphocytes is correct EXCEPT:

(a) Maximal activation of cytotoxic T cells involves both MHC-I and MHC-II

(b) Both T helper and cytotoxic cells have a TCR

(c) Both T helper and cytotoxic cells have receptors for IL-1

(d) Both cells have receptors for IL-2

(e) CD4+ T helper cell binds an antigen on the surface of an APC

7. A fall in sodium plasma concentration:

(a) Decreases the freezing point of plasma

(b) Increases intracellular fluid volume

(c) Is not associated with thirst

(d) Can't be caused by excessive (uncontrolled) secretion of ADH (anti- deuteric hormone)

(e) Causes edema

8. A 23 year old female with a red cell count of $3.2 \times 10^6/\mu\text{l}$, hematocrite of 37%, and haemoglobin concentration of 120g/L. According to the above parameters, which of the following statements is TRUE?

(a) The RBCs are normocytic, normochromic

(b) The RBCs are microcytic, normochromic

(c) The RBCs are microcytic, hypochromic

(d) The RBCs are macrocytic, normochromic

(e) The RBCs are macrocytic, hyperchromic

9. Which of the following about Haemophilia A and Von-Willibrand inheritance is NOT TRUE?

- (a) Von-Willibrand is a hemorrhagic disease
 - (b) Haemophilia A is usually confined to males
 - (c) Haemophilia A is inherited as a sex-linked abnormality
 - (d) Haemophilia A passes from mother to child
 - (e) Von-Willibrand disease also appears in males only**
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10. A person with (A Rh⁻) blood can receive blood transfusion from which of the following?

- 1. A Rh⁺
- 2. B Rh⁺
- 3. AB Rh⁻
- 4. O Rh⁻
- 5. A Rh⁻

- (a) 1 only
 - (b) 4 only
 - (c) 3 only
 - (d) 4 + 5**
 - (e) 1 + 5
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11. Which of the following combinations is NOT TRUE?

	Factor #	Factor Name	Pathway involved
(a)	3	Tissue Thromboplastin	Extrinsic Pathway
(b)	10	Stuart Factor	Both Pathways
(c)	1	Fibrinogen	Both Pathways
(d)	12	Hageman Factor	Intrinsic Pathway
<u>(e)</u>	<u>13</u>	<u>Fibrin Stabilizing Factor</u>	<u>Intrinsic Pathway</u>

12. Which of the following combinations is NOT TRUE?

		Haemophilia A	Von-Willibrand Disease
(a)	Inheritance	Sex-linked	Autosomal
(b)	Bleeding Time	Normal	Prolonged
(c)	VIII:C	Low	Low
(d)	VIII:Ag	Normal	Low
<u>(e)</u>	<u>Aggregation</u>	<u>Normal</u>	<u>Normal</u>

13. Which of the following is NOT a function of thrombin?

- (a) VIII \rightarrow VIII_a
 - (b) Fibrinogen \rightarrow Fibrin
 - (c) IX \rightarrow IX_a**
 - (d) XIII \rightarrow XIII_a
 - (e) Protein C \rightarrow Protein C_a
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14. Which of the following statements most describe why RBC's are efficient in carrying oxygen:

1. Contains hemoglobin
2. Have no nucleus
3. Have many mitochondria needed to produce ATP
4. Biconcave shape
5. 4 oxygen molecules are carried by hemoglobin

- (a) 1, 3, 4
 - (b) 2, 4, 5
 - (c) 1, 2, 4, 5**
 - (d) 1, 2, 3, 5
 - (e) 1, 2, 3, 4, 5
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15. Which of the following regarding iron absorption is NOT TRUE?

(a) The daily iron intake is usually equal to daily iron requirement

(b) Women have less store of iron than men

(c) More than 65 % of iron is present in hemoglobin

(d) Iron absorption is mainly in the upper part of the jejunum

(e) There is more iron absorption from meat and meat products than from vegetables

16. A blood sample was tested and the results indicated a red cell count of $3.8 \times 10^{12}/L$ and hemoglobin concentration of 16g/deciliter. From the following data:

(a) We can tell the person is a female

(b) We can calculate the mean corpuscular volume (MCV)

(c) We can calculate the mean corpuscular hemoglobin (MCH)

(d) We can calculate the mean corpuscular hemoglobin concentration (MCHC)

(e) We can tell if the red blood cells are normocytic, microcytic or macrocytic.

17. All of the following regarding the bleeding caused by a small cut wound in the skin are true EXCEPT:

(a) Can be stopped by a vascular spasm

(b) It will stop within a period of 5 minutes

(c) It will be prolonged if Von-Willibrand factor is deficient

(d) It will be prolonged in the case of thrombocytopenic purpura

18. Which of the following regarding % saturation of hemoglobin and oxygen content is NOT CORRECT?

(a) The % saturation of hemoglobin is dependent on pO_2 and completely independent on the concentration of hemoglobin

(b) The oxygen content is dependent on the concentration of hemoglobin

(c) The % saturation of hemoglobin is dependent on pO_2 as well as on the concentration of hemoglobin

(d) The oxygen content VS pO_2 will change when the concentration of hemoglobin is changed

(e) The % saturation of hemoglobin VS pO_2 graph will remain the same despite changing the hemoglobin concentration

19. Which of the following statements regarding leukocytes are correct

1. They move out to the tissues by a process called emigration

2. Neutrophils and macrophages are required in phagocytosis

3. Inflammatory cells are attracted by bacterial molecules and inflamed tissue by a process called chemotaxis

4. Leukopenia is an increase in the number of WBC's in the circulation

(a) 1 and 2 only

(b) 2, 3, 4

(c) 1, 2, 3

(d) 1, 2, 3, 4

(e) 3 and 4 only

20. Which of the following regarding ABO blood groups is NOT CORRECT?

(a) Full cross match involves reacting recipient's plasma with patient's RBCs

(b) Most cases of blood incompatibility are due to not cross matching the different blood groups

(c) Anti- A and anti-B antibodies are sometimes absent in blood group O

21. Which of the following regarding heme structure and abnormalities is CORRECT?

- (a) Heme consists of a tetrapyrrole ring, with 4 methyl, 2 vinyl and 2 propionate groups**
 - (b) Structural changes in the heme are the most common cause of abnormal hemoglobin
 - (c) Heme iron if found in aqueous solution will be present in the ferrous (Fe^{2+}) state
 - (d) The distal histidine of heme is involved in the binding to ferrous iron
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22. High levels of conjugated bilirubin, near-normal levels of unconjugated bilirubin and low fecal stercobilinogen is best characterized by:

- (a) Hepatitis
 - (b) Hemolytic disease
 - (c) Obstruction of the bile duct**
 - (d) Low levels of UDP- glucuronic acid
 - (e) Any of the above
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23. All of the following regarding 2,3 BPG are correct EXCEPT:

- (a) Decreases the oxygen-binding capacity of hemoglobin
 - (b) Decreases some of the effects of sickle cell anemia**
 - (c) Binds to the pocket situated between the two β globin chains
 - (d) Raises the P_{50} of hemoglobin
 - (e) All of the above are correct
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24. Lead poisoning will result in accumulation of:

- (a) Porphobilinogen
 - (b) δ -aminolevulinic acid and protoporphyrin IX**
 - (c) Uroporphyrinogen
 - (d) Hydroxymethylbilane
 - (e) δ -aminolevulinic acid and coproporphyrinogen
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25. Which of the following regarding glutathione and G6PD deficiency is NOT CORRECT?

- (a) Glutathione is a tri-peptide that consists of (gly-cys-glu)
 - (b) G6PD production of NADPH is required to maintain glutathione in a reduced state
 - (c) G6PD A⁻ variant (class III) is associated with 80% enzyme activity in reticulocyte cells
 - (d) In cells such as the liver, G6PD is not the only way for the production of NADPH
 - (e) G6PD deficiency is associated with non-sense and frameshift mutations**
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26. Which of the following regarding hemoglobin and myoglobin is NOT CORRECT?

- (a) Both are rich in α -helical content
 - (b) Both bind one oxygen molecule per heme
 - (c) Hemoglobin has 7 α -helical segments in its α chain and 8 in its β chain
 - (d) Both contain a proximal histidine (F8) and a distal histidine (E7)
 - (e) The P_{50} of myoglobin is lower than hemoglobin but higher than fetal hemoglobin**
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27. All of the following are required in heme synthesis EXCEPT:

- (a) Glycine
 - (b) Pyridoxal Phosphate
 - (c) Succinyl CoA
 - (d) Acetyl CoA**
 - (e) Ferrous iron
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28. HIV wasting syndrome is:

- (a) Body weight loss >50%
 - (b) Body weight loss >10%, unexplained chronic diarrhea, prolonged fever and physical weakness**
 - (c) Chronic diarrhea associated persistent generalized lymphadenopathy
 - (d) Associated with clinical stage C of HIV infection
 - (e) Persistent fever, malaise, and intermittent diarrhea
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29. Regarding the epidemiology of HIV, which of the following is NOT CORRECT?

(a) Most people infected do not know they have the disease

(b) The epidemic has now reached a plateau

(c) 90% of children infected with HIV are either due to being born to an infected mother or breast milk

30. Which of the following regarding HIV diagnostic techniques is NOT CORRECT?

(a) Screening tests look for antibodies to the virus and have now reached almost a sensitivity of 100%

(b) Screening tests look for antibodies to p24 and p55 antigens

(c) The most common confirmatory test used is Western Blot

(d) A minimum of 2 to 3 bands are need to confirm a positive diagnosis in Western Blot technique

(e) Viral load can be found by measuring viral RNA or DNA using molecular detection methods

31. Regarding the WHO clinical staging guidelines of HIV/AIDS, all of the following are correct EXCEPT:

(a) This staging system is used by WHO for resource limited countries

(b) The staging depends entirely on clinical symptoms

(c) Staging is classified according to count of CD4+ T cells

(d) The patient's clinical symptoms are tested in every medical visit

(e) It consists of 5 different clinical stages

32. Regarding bacterial infection of the blood, all of the following are correct EXCEPT:

(a) Sepsis is associated with an exaggerated systemic inflammatory response

(b) Septicemia can result from disseminated spread of a pathogen at a local site of infection

(c) The severity and predominance of the disease is the same regardless of the causative agent of infection

(d) Misdistribution of oxygen to several organs in the body

(e) Proceeds to multiple organ dysfunction in the last stages of infection

33. A 29 year old woman suffering from severe menstrual bleeding for a few weeks had her blood tested. The results indicated a MCV of 63 fl, MCHC of 28 g/dl and RCC of $3 \times 10^6/\mu\text{l}$. Which of the following indicators is inconsistent with the condition she has?

- (a) Decreased transferrin saturation
 - (b) Low level of hepcidin
 - (c) Decreased serum ferritin
 - (d) Decreased total iron binding capacity**
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34. A 60 year old man suffers from episodes of infection and intermittent bleeding. Results showed that his hemoglobin concentration is below normal but with a normal MCHC. Thrombocytopenia was proven by a vast decrease in number of platelets. Which of the following conditions is least likely to be involved as well?

- (a) Monocytopenia
 - (b) Granulocytopenia
 - (c) Splenomegaly**
 - (d) Absolute lymphocyte count is normal
 - (e) Low RBC count
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35. A 43 year old woman suffers from weakness and fatigue for almost 2 months. Her blood count came up with a MCV of 110 fl, [Hb] of 8g/dl and MCHC of 32 g/dl. She is also positive for neutropenia, and has a decreased number of platelets. The reticulocyte levels have reached almost 4%. Which of the following is the most probable cause of her results?

- (a) Decreased utilization of iron
 - (b) Increased level of hepcidin
 - (c) Toxic effect on the stem cells
 - (d) Drug adverse reaction
 - (e) Antibody mediated**
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36. In anemia of chronic disease, which of the following is CORRECT?

(a) MCV normal, [↓ serum ferritin] [↓ iron stores] [↓ TIBC]

(b) MCV normal, [↑ serum ferritin] [↑ iron stores] [↓ TIBC]

(c) MCV low, [↓ serum ferritin] [↓ iron stores] [↓ TIBC]

(d) MCV high, [↓ serum ferritin] [↑ iron stores] [↓ TIBC]

(e) MCV low, [↓ serum ferritin] [↓ iron stores] [↑ TIBC]
