

# Test Bank



**Subject:**  
**HLS- MID**



**Collected by:**

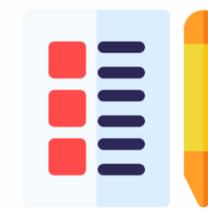
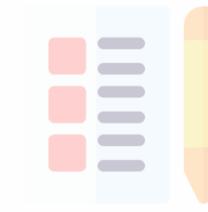
**Hiba M.Abu-Hayyah**

**Samia S.Simrin**



**Corrected By:**

**Ameen I.Alsaras**



## P.P Collected Questions OF HLS Midterm

### Physiology

1-Most of the blood exists in:

- a. arteries
- b. veins
- c. heart
- d. lungs
- e. capillaries

answer: b

2-Which of the following is wrong about blood pH?

- a. acidosis is below 7.35
- b. alkalosis is above 7.45
- c. blood Ph is different from water Ph as the neutral Ph is 7.4 rather than being 7
- d. any change in Ph causes death

answer: d

3-A 40-year old woman with 110 g/L Hb,  $3 \times 10^{12}/L$  RBCs and a mean cell diameter of 8.2 microns is not suspected to have:

- a. IDA
- b. B12 deficiency
- c. Folate deficiency

answer: a

4- Which of the following is wrong about B12 deficiency?

- a. it leads to megaloblastic anemia
- b. it mostly affects WBCs
- c. hemoglobin content is relatively high

answer: b

5- Which of the following is wrong about albumin?

- a. it maintains exchange of fluids
- b. it is the most abundant plasma protein
- c. it transports CO<sub>2</sub>

answer: c

6-Which of the following is a rare cause of anemia?

- a. iron deficiency
- b. vitamin B12 deficiency
- c. chronic inflammation

answer: b

7- Arrange the following according to activity in hematopoiesis-descending arrangement-

1. Vertebra

2. Sternum

3. Femur

4. Tibia

5. Ribs

- a. 1,2,3,4,5
- b. 1,2,5,3,4
- c. 2,1,5,3,4
- d. 2,3,5,4,3

answer: b

8- Which of the following is true about iron?

- a. the absorption of nonheme iron is restricted to the jejunum
- b. iron is absorbed in ferric form more readily than ferrous form
- c. the second storage for iron in the blood is ferritin

answer: c

9- All of the following are required in heme synthesis EXCEPT:

- a. Glycine
- b. Pyridoxal Phosphate
- c. Succinyl CoA
- d. Acetyl CoA
- e. Ferrous iron

answer: d

10- 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

answer: c

11-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 stored 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

answer: a

12-Which of the following is true about transferrin?

- a. It binds only 2 molecules of iron
- b. used for transport and storage of iron in the blood
- c. It binds to iron in its ferrous form

answer: a

13-Which of the following is not true?

- a. IDA & sideroblastic anemia are the most common forms of microcytic anemia
- b. indices calculated from blood cells are defined
- c. IDA is common clinical problem throughout the world
- d. estimated to affect 30% of the world's population

answer: a (Note: Defined=can be calculated)

14-A 23 year-old female with a red cell count of  $3.2 \times 10^6$ /microliter, hematocrit of 37%, and hemoglobin 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

answer: d

15-In severe chronic anemia, all of the following are compensatory mechanisms except:

- a. PO<sub>2</sub> increases in arterial part
- b. 2,3-BPG increases
- c. cardiac output at rest is increased
- d. affinity of hemoglobin to oxygen is decreased

answer: a

16-Choose the true statement about hemoglobin:

- a. hemoglobin saturation curve is dependent on  $PO_2$  and hemoglobin concentration
- b.  $O_2$  content is dependent only on  $PO_2$  and independent on Hemoglobin concentration
- c. hemoglobin saturation curve is independent on hemoglobin concentration

answer: c

17- A blood sample was tested and the results indicated a red cell count of  $3.8 \times 10^6/L$  and hemoglobin concentration of 16g/deciliter. From the following data:

- a. We can tell that the person is a female
- b. We can directly calculate the mean corpuscular volume (MCV)
- c. We can directly calculate the mean corpuscular hemoglobin (MCH)
- d. We can directly calculate the mean corpuscular hemoglobin concentration (MCHC)
- e. We can directly tell if the red blood cells are normocytic, microcytic or macrocytic

answer: c

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 if the concentration of hemoglobin is changed
- e. The % saturation of hemoglobin VS  $pO_2$  graph will remain the same despite changing the hemoglobin concentration

answer: c

19- which of the following results in shift to the right in hemoglobin-oxygen saturation curve?

- a. exercise
- b. decrease in temperature
- c. increase in pH
- d. decrease in  $PCO_2$
- e. decrease in 2,3-diphosphoglycerate

answer: a

20- Which of the following is wrong about HbF?

- a. it could be found in feti as well as in adults but in different concentrations
- b. it has affinity for  $O_2$  similar to that of Myoglobin which is higher than the Hemoglobin affinity for  $O_2$
- c. it can carry 8 Oxygen atoms

answer: b

21- Which of the following is wrong about WBCs?

- a. in chronic myelogenous leukemia you see high blood count of myeloblasts
- b. leukemia results when leukocyte count increases and doesn't return back to normal
- c. usually the more undifferentiated the WBCs, the more acute is the leukemia

answer: a

22- Which of the following is wrong about lymph?

- a. It contains plasma proteins
- b. It contains cells
- c. Lymph flow increases by muscle contractions (increases with muscular activity)
- d. fluids filtered are usually less than reabsorbed

answer: d

23- A tissue that has no lymphatic capillaries

- a. GIT
- b. Respiratory tract
- c. CNS
- d. UGT

answer: c

---

## Biochemistry

1- Which of the following enzyme deficiencies causes photo-insensitive porphyria?

- a. Coproporphyrinogen III oxidase
- b. uroporphyrinogen decarboxylase
- c. ALAD
- d. Ferrochelatase

answer: c

2- Which of the following is wrong about HbA<sub>1c</sub> (glycosylated hemoglobin)?

- a. measurement of glucose bound to valine on Beta hemoglobin chains
- b. patient should be fasting
- c. according to IFCC 100mmol/mol is acceptable

answer: b+c = question deleted

3- Which of the following is wrong about allosteric regulation?

- a. low pH decreases the affinity of hemoglobin towards oxygen
- b. the major effect of CO<sub>2</sub> is form carbamate
- c. 2,3-BPG does its action by increasing electrostatic interactions
- d. Bohr effect works by electrostatic interaction between His with negatively charged amino acid on the same chain

answer: b

4- Which of the following is wrong about HbE?

- a. It is caused by mutation that affects B chain
- b. It is common in Africans
- c. It results in defected proteins

d. A truncated (short) beta-chain is produced

answer: b

5-In Hb Cowtown where His 146 is replaced by Leucine, choose the correct statement:

- a. it stabilizes R state and increases affinity for oxygen
- b. it stabilizes T state and increases affinity for oxygen
- c. it stabilizes R state and decreases affinity for oxygen
- d. it causes degradation of protein

answer: a

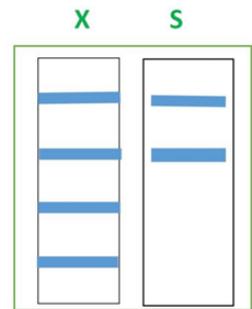
6-Hb Bart means that you have:

- a. 4 chains of gamma
- b. 4 chains of beta
- c. 3 chains of beta and 1 chain of alpha

answer: a

7-You have sample X and S in heme electrophoresis, what can you conclude about sample S? (in X you have HbA, HbC, HbS, HbF, NOT ORDERED)

- a. HbS homozygous
- b. HbS heterozygous
- c. HbSC
- d. A neonate 4 weeks before birth



answer: d

8-Fetal pyruvate kinase influence to have hemoglobin with more affinity is by:

- a. producing more ATP
- b. producing more 2,3-BPG
- c. producing less 2,3-BPG

answer: c

9-G6PD deficiency class 2 (Mediterranean) produce enzyme with

- a. more activity
- b. less stability
- c. less activity
- d. B+C

answer: c

10-Heme oxygenase's function is:

- a. converting ferric to ferrous
- b. Absorption of iron
- c. carries iron in blood
- d. release iron out of heme

answer: d

11- Which of the following is wrong about hepcidin?

- a. It is increased in iron overload
- b. It is decreased in inflammation
- c. it decreases iron absorption

answer: b

12- Which of the following is true regarding blood coagulation and Gla domains?

- a. warfarin affects coagulation directly by inhibiting formation of these domains
- b. chelated domains can bind to platelet negatively charged surface
- c. Factor XII contains Gla domain
- d. these domains are formed by carboxylation of 1-6 Glu residues

answer: b

13- Which of the following is true about the action of protein C and protein S?

- a. They help thrombin to bind thrombomodulin
- b. They bind thrombin with antithrombin 3
- c. They degrade factor 5 and factor 8

answer: c

14- Jaundice in neonates is caused by:

- a. increased hemolysis
- b. decreased release to bile duct
- c. decreased transport in blood
- d. decreased conjugation

answer: d

15- Fibrin stabilizing factor is:

- a. factor V
- b. factor VII
- c. factor X
- d. factor XIII
- e. factor II

answer: d

16- Lead poisoning affects the enzyme which forms:

- a. Ferroprotoporphyrin IX
- b. Uroporphyrinogen III
- c. Coproporphyrinogen III

answer: a

17- Which of the following statements is False?

- a. BPG forms salt bridges with a lysine, a histidine and in both beta chains.
- b. BPG increases the energy needed to transform hemoglobin from T to R state
- c. Both Mb & Hb are affected by 2,3-BPG

answer: c

18-Which of the following doesn't have alpha chains?

- a. HbS
- b. HbH
- c. HbF

answer: b

19- Which of the following doesn't happen in RBC ?

- a. PPP
- b. Heme Synthesis
- c. glycolysis

answer: b

20- Which of the following is wrong about heme degradation?

- a. Heme oxygenase produces  $Fe^{+2}$ , CO, NADP+ while catalyzing the reaction
- b. Bilirubin is transported to the liver by binding noncovalently to albumin
- c. bilirubin is formed directly from heme

answer: c

21-All of the following favor the transformation from the T form to the R form of hemoglobin except:

- a. decreased pH
- b. decreased 2,3-BPG
- c. decreased temperature

answer: a

22-Which of the following is true?

- a. most cells, unlike RBCs, have another pathway to synthesize NADPH
- b. NADH is required for the activity of cytochrome b5 reductase
- c. G6PD deficient Mediterranean variant shows severe enzyme deficiency of young cells
- d. all of the above are true

answer : d

23-Lead poisoning will result in accumulation of:

- a. Porphobilinogen
- b.  $\delta$ -aminolevulinic acid and protoporphyrin IX
- c. Uroporphyrinogen
- d. Hydroxymethylbilane
- e.  $\delta$ -aminolevulinic acid and coproporphyrinogen

answer: b

24- Which one of these Hb isn't normally found in your body?

- a. HbH
- b. HbF
- c. HbA<sub>2</sub>

answer: a

25- Which of the following doesn't cause a hemoglobinopathy?

- a. increasing the tendency of iron to stay in the ferrous form
- b. decreasing numbers of hemoglobin
- c. changing hemoglobin structure

answer: a

26- Which of the following is wrong about iron?

- a. transferrin is for serum transport and storage of iron
- b. ferric= $Fe+3$ , ferrous= $Fe+2$

answer: a

27- Which of the following is true about Hb?

- a.  $\beta_4$  Hb has more sigmoidal saturation curve and thus higher  $p_{50}$
- b. Hb bart is composed of  $2\gamma 2\alpha$

answer: a

28- Which of the following is wrong about G6PD deficiency?

- a. GSH is normally maintained in the reduced form by Glutathione reductase
- b. G6PD gene is located on the X chromosome
- c. G6PD deficiency is mainly caused by large deletions

answer: c

29- Which of the following is true about R and T forms of Hb?

- a. R releases protons
- b. R has less affinity for oxygen than T

answer: a

30- Which of the following is wrong about the structure of heme?

- a. iron is coplanar with the heme in deoxy form Hb
- b. Iron can form six bonds
- c. porphyrin consists of four rings (designated A-D) called pyrrole rings

answer: a

31- Which of the following is NOT a function of thrombin?

- a. VIII  $\rightarrow$  VIIIa
- b. Fibrinogen  $\rightarrow$  Fibrin
- c. IX  $\rightarrow$  IXa
- d. XIII  $\rightarrow$  XIIIa
- e. Protein C  $\rightarrow$  Protein Ca

answer: c

32-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

answer: a

33-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

answer: c

34-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  $\beta$  globin chains
- d. Raises the P50 of hemoglobin
- e. All of the above are correct

answer: b

35-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

answer: e

36-Which of the following regarding hemoglobin and myoglobin is NOT CORRECT?

- a. Both are rich in  $\alpha$ -helical content
- b. Both bind one oxygen molecule per heme
- c. Hemoglobin has 7  $\alpha$ -helical segments in its  $\alpha$  chain and 8 in its  $\beta$  chain

- d. Both contain a proximal histidine (F8) and a distal histidine (E7)
- e. The P50 of myoglobin is lower than hemoglobin but higher than fetal hemoglobin

answer : e

37- Which of the following is not true about thalassemia major?

- a. HbA2 increases in  $\beta$  thalassemia
- b. HbF increase in  $\beta$  thalassemia
- c. Hb Bart's increase in  $\alpha$  thalassemia
- d. in a thalassemia major 3 or 4 copies are mutated but in  $\beta$  thalassemia major 2 copies are mutated

answer: d

38-Regarding the binding of 2,3 BPG, it makes a cross linking by which subunits?

- a. B1, A1 subunits
- b. B1, B2 subunits
- c. B1, A2 subunits
- d. A1, A2 subunits

answer : b

39- Which of the following is wrong about F XIII (Fibrin Stabilizer)?

- a. related only to the Intrinsic pathway of coagulation
- b. it is a transglutaminase that is activated by thrombin

answer : a ((it's related to both; Intrensic & extrensic ones))

40-An amino acid substitution in one of chains of hemoglobin could lead to hemoglobinopathy (hemoglobin with abnormal function) for any of the following reasons EXCEPT:

- a. An increase in the 2,3-BPG binding affinity
- b. A change in the affinity of subunits contact
- c. A change in the solubility properties of reduced hemoglobin
- d. An increase in the hydrophilic property of heme-pocket
- e. An increase tendency of the heme iron to exist in the reduced state

answer: e

41-Heme oxygenase:

- a. Produces carbon dioxide
- b. Can oxidize the membrane bridge between two pyrole rings of heme
- c. Requires molecular oxygen
- d. Produces bilirubin
- e. two of the above are correct

answer: c

42-Which of the following is not required for clot formation?

- a. vitamin K

- b. Ca
- c. Cl
- d. Vitamin A
- e. fibrinogen

answer: c and d

43- Which of the following is not required for heme biosynthesis?

- a. heme oxygenase
- b. Glycine
- c. Succinyl CoA

answer : a

44-Which of the following is true about uroporphyrinogen III?

- a. result from direct conversion of coproporphyrinogen
- b. it is a substrate for uroporphyrinogen decarboxylase

answer : b

45-Which of the following is true about HbS and HbA?

- a. both have different migration speed in electrophoresis at pH 1-2
- b. both have different migration speed in electrophoresis at pH 8-9

answer: b

46-All of the following are true about heme except:

- a. Contains 4 methyl and 4 vinyl groups attached to it
- b. The iron is held in the center of the heme molecule by bonds to the four nitrogens of the porphyrin ring.
- a. Heme is a complex of protoporphyrin IX and ferrous iron ( $Fe^{2+}$ )

answer : a

47-Which of the following can't be present in beta thalassemia:

- a. HbH
- b. HbA
- c. HbF

answer : a

---

## Histology

1- Which of the following is true about all secondary lymph organs?

- a. contain lymph follicles
- b. contain epithelial reticular cells as stroma
- c. contain afferent vessels
- d. contain capsule

answer: a

2-Choose the wrong statement:

- a. Unlike platelets, RBCs never stack together
- b. Internum of the crystalloid granules contains major basic proteins

answer: a

3-T cells in spleen are mostly presented in:

- a. Lymphoid follicles
- b. splenic cords
- c. splenic sinuses
- d. PALS

answer: d

4-The right arrangement of hemoglobin chains synthesis in humans:

- a. it starts in liver then yolk sac and finally in bone marrow
- b. it starts in yolk sac then liver and finally in bone marrow
- c. yolk sac and liver synthesize hemoglobin for almost the same period in gestation
- d. liver and yolk sac then bone marrow after birth

answer: b

5- Which of the following is wrong about neutrophils?

- a. it has its own specific granules
- b. it lives for several hours only and stores glycogen
- c. it has polymorphic nucleus throughout its life
- d. measuring neutrophils from blood represents all neutrophils in our body

answer: d

6-The cell that contains bi-lobed nucleus and large granules that obscure its nucleus

- a. monocyte
- b. eosinophil
- c. basophil
- d. neutrophil

answer: c

7-A cell with c shaped single non lobulated nucleus:

- a. mast cell
- b. eosinophil
- c. neutrophil
- d. monocyte

answer: d

8-Which of the following is covered by stratified squamous non keratinized epithelium?

- a. palatine tonsils
- b. appendix
- c. Peyer's patch

answer: a

9-Choose the right statement about thymus gland

- a. it has afferent lymph vessels
- b. Thymic epithelial cells form a blood-thymic barrier in the medulla
- c. thymic epithelial cells form the stroma of the gland

answer: c

10-Lymphocytes in the circulation enter lymph node from:

- a. afferent vessels
- b. marginal zone
- c. postcapillary venule

answer: c

11- Which of the following is wrong about reticulocytes?

- a. Contain DNA not RNA
- b. increases in hemolytic anemia
- c. can synthesize heme

answer: a

12-Cytotoxic T Lymphocytes' marker:

- a. CD45+
- b. CD34-
- c. CD3+
- d. CD19-
- e. CD8+

answer: e

13-Which of the following is wrong?

- a. Nucleus is eccentric in promyelocyte
- b. In Myelocyte phase, specific granules start to appear
- c. In promyelocyte phase, primary granules appear

answer: a

14- Which of the following is wrong about HLA class II?

- a. it is presented in all nucleated cells
- b. it is recognized by T helper
- c. it is coupled to peptide product of proteins the cells had ingested

answer: a

15- Which of the following is wrong about ultrastructure of platelets?

- a. Dense tubular system (Ca<sup>+</sup>) is in peripheral zone
- b. Alpha granules: clotting factors + serotonin
- c. They have thick glycocalyx
- d. Hyalomere contains cytoskeleton and membranous channels while Granulomere contains granules and organelles

answer :b

16- Which of the following is true about blood-thymus barrier?

- a. antigens that cross is cause immunological tolerance
- b. It envelops groups of T cells that are multiplying and maturing in medulla

answer :a

17- Which of the following is wrong about lymph nodes?

- a. a heel diabetic ulcer primarily causes enlargement of the vertical group of the superficial inguinal lymph nodes
- b. they have many afferent vessels and one or two efferent vessels
- c. the lymph node can be divided into an outer cortex and inner paracortex.

answer: a

18-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

answer :c

19- Which of the following is wrong about neutrophil?

- a. peripheral blood count of neutrophils is an absolute measure of their total count
- b. Barr body appears in females
- c. its primary granules contain myeloperoxidase

answer :a

20- Which of the following is true about second exposure to pathogen in the lymph node

- a. Second response is faster than the first one

answer : a

21-All of the following are characteristics of all secondary lymphoid organs except

- a. They have PeriArteriolar Lymphatic Sheath ( PALS )
- b. They are sites for lymphocytes to encounter pathogens and become activated
- c. Spleen is considered one of them

answer :a

22- Which of the following is wrong about WBCs?

- a. Neutrophils are the most prominent cells in blood
- b. eosinophils are more phagocytic and bactericidal than neutrophils
- c. B cells can act as APCs

answer :b

23-Which of the following cells increase in level during parasitic infections?

- a. Neutrophils
- b. Basophils
- c. Eosinophils
- d. Lymphocytes
- e. Monocytes

answer: c

24-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

answer: e

25-Which of the following statements is NOT CORRECT?

- a. Dendritic cells trap antigens on their surface and present them to B cells only
- b. Interdigitating dendritic cells are found in the thymus-dependant zones of the lymph nodes
- c. Follicular dendritic cells can present an antigen not associated with MHC to a B cell

answer :a

26-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

answer: a

27- Which of the following is the correct statement?

- a. Cytotoxic cells recognize MHC 1 and the Ag presented on it
- b. cytotoxic T-Cells bind to MHC 2
- c. cytotoxic T-Cells express MHC 2 on their surface

answer : a

28- Which of the following is correct about monocytes?

- a. They are phagocytic cells
- b. They increase dramatically in parasitic infections
- c. They are responsible for allergic reactions

answer :a

29-Which of the following cells have granules containing peroxidase and histaminase?

- a. neutrophils
- b. basophils
- c. eosinophils

answer : c

30-Which statement is False about spleen ?

- a. Splenectomy Affect Cell-mediated and Antibody mediated Immune response
- b. People without spleen are more prone to infections with unencapsulated bacteria
- c. It is divided to red and white pulp

answer: b

31-Foreign antigen recognition in the spleen takes place in:

- a. marginal zone sinuses
- b. splenic sinusoids
- c. splenic cords

answer: a

32-Not involved directly in an immune response to a foreign antigen:

- a. thymus
- b. WBCs
- c. MALT

answer: a

33-We recognize myelocytes from:

- a. specific granules
- b. Primary granules
- c. size

answer: a

34-Which of the following is false?

- a. monocytes have kidney shaped nucleus
- b. 5-lobed-nucleus neutrophils are less mature than 4-lobed ones
- c. B and T lymphocytes cannot be distinguished under LM

answer: b

35-Which of the following is false:

- a. neutrophils phagocytic activity is enhanced by the presence of complement
- b. absence of barr body in neutrophils and other body cells indicate true male (XY)
- c. Neutrophils are called cells of chronic inflammation

answer: c

36-which of the following result in true neutrophilia?

- a. bacterial infection
- b. exercise
- c. administration of epinephrine

answer: a

37-Incorrect lymphatic drainage:

- a. thoracic duct with right subclavian
- b. Right lymphatic duct Drains from the upper right quadrant of the body

answer:a

---

## Pharmacology

1-We use for Iron toxicity:

- a. Deferoxamine
- b. Iron dextran
- c. Ferrous fumarate

answer:a

2- Which of the following is true about folate treatment?

- a. Can be given prophylactically.
- b. causes remission of pernicious anemia with continued neurological damage
- c. Parenteral administration is rarely necessary because it is well absorbed
- d. All of the above

answer:d

3-Its deficiency causes homocysteine accumulation and vascular occlusions:

- a. Methylmalonyl-CoA
- b. Iron
- c. Folic Acid

answer: c

4-Which of the following is true about Folic acid?

- a. given in all megaloblastic anemia

- b. given in *Diphyllobothrium latum* infestation
- c. Folic Acid causes remission of pernicious anemia but without curing neurological manifestations

answer: c

5-A patient has very severe anemia so he is given:

- a. Ferrous fumarate
- b. ferrous sulfate
- c. ferrous gluconate
- d. any oral preparation
- e. iron Sorbitol

answer: e

6-All of the following decrease Iron bioavailability EXCEPT:

- a. binding to hemoglobin or myoglobin
- b. Acidity form of the food
- c. ferrous sulfate or ferrous gluconate
- d. low iron stores
- e. anemia

answer: question deleted

7-Why is it better to use Deferasirox instead of Deferoxamine in chronic anemia?

- a. It's taken orally and more convenient
- b. it is more effective
- c. it is cheaper

answer: a

لا أراكم الله ظلمة، ولا حلت بصدوركم غمة، ولا طلبتم من الله شيئاً إلا أتمه.

موفقين يا رب.