Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF MEDICAL SCIENCES

UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF MEDICAL LABORATORY SCIENCES

BMLS 12S

AML 4220 : HEMATOLOGY I

SPECIAL/SUPPLEMENTARY EXAMINATION

OCTOBER 2013 SERIES 2 HOURS

Instructions to candidates:

This paper consist of **TWO** sections A and **B**

Section A –Contains MCQS, any wrong response will be penalised. Answer **ALL** questions in **Section B**.

SECTION A – MCQs – (30marks)

1. What does a haematocrit of 40% indicate
   a) In a sample of 100ml of blood 40mls are blood cells
   b) In a sample of 100mls of plasma 40mls are blood cells
   c) In a sample of 40mls of blood 100% is blood cells
   d) In a sample of 40mls of plasma 100% is blood cells
   e) In a sample of 40mls of blood 40mls are blood cells

2. Which below cannot affect haematoit value
   a) Shock
   b) Dehydration
   c) Excessive intravenous fluid administration
   d) Infection
   e) Anemia

3. Which below best describes electrophoresis:
   a) Separating the components of normal Hb
   b) Separating the components of normal red blood cells
   c) Separating and measuring normal and abnormal Hb
   d) Separating and measuring components of heam
   e) Separating and measuring components of globin

4. Which statement below is false
   a) HbA is the normal haemoglobin found in 95- 100% of adults
   b) HbA2 presence implies b-thalassemia
   c) Hemoglobin electrophoresis can be done on different medium –cellulose acetate or starch gel
   d) The pH may be altered in Hemoglobin electrophoresis to expand the range of test
   e) Presence of Hbs implies b – thalassemia

5. MCHC which is false
   a) Represent the term mean corpuscular hemoglobin concentration
   b) It depends upon the size of the RBC and also the amount of Hemoglobin in each cell
   c) MCHC is not depended on the RBC count
   d) Useful in diagnosis of diseases /Conditions that are not dependent upon the number of RBCs.
   e) It's a rarely used RBC indices in diagnosis of anaemia

6. ESR which is true :
   a) It measures the rate/time at which esinophils form a whole blood sample settle to the bottom of a vertical tube
   b) Its influenced by Red blood cell volume surface used, density , aggregation and surface change
   c) Sample usually examined 24hrs after collection.
   d) Sample is collected in a plain bottle
   e) Normal values are 80 – 90mm/hr

7. ESR which statement below is false
   a) It's a sensitive but non specific test
   b) Early indicator of inflammation
   c) Currently has reduced clinical use due to the preferred use of C- reactive protein
   d) Normal physiological state can raise the ESR such an pregnancy
   e) Polycythemia usually results in a increased ESR

8. Which below can not affect the asmotic fragility of a cell
   a) Burns
   b) Hereditary spherocytosis
   c) Dehydration
   d) Splenecting
   e) Iron deficiency anemia

9. A patient has a WBC (White blood Cell) count of 6000/vl and a differential count shows 30% neutrophilis and 70% lymphocytes which statement best described above statement.
    a) Patient has lymphocytosis
    b) {Patient has normal neutrophils count
    c) The patient has decreased neutrophil production
    d) The patient has a severe allergic reaction
    e) The patient has a low white blood cell count.

10. The following can increase neutrophils except
    a) Exercise
    b) Inflammatory disease
    c) Stress response
    d) Ischemic necrosis such as burns
    e) Infections

11. Which statement below is true
    a) Anticagularts are substances that prevent coagulation and allow for separation of blood into plasma and saline components
    b) EDTA is an example of anticoagulate
    c) Excess EDTA caused no change to the RBCs
    d) Sodium citrate is the anticoagulant of choice for a total blood count
    e) Hepain is commonly used for blood films

12. In regards to hepain:
    a) It acts by asmplexing with factors XII to prevent blood doting
    b) Its suitable for blood films
    c) It's the prepared anticoagulant for osmotic fragility test
    d) Its never used for spun haematoit
    e) It doesn't cause platelet chopping

13. Which statement is false
    a) Growth factors allow for differentiation, proliferation and maturation of cells
    b) Availability of growth factors has made it possible to administer chemotherapy
    c) Availability of the growth factors has improved patient care by improving body's ability to fight infection
    d) Growth factors are used in treating anaemia hence reducing transfusion
    e) Growth factors used in clinical medicine are produces by chemical synthesis

14. G-CSF
    a) Acts primarily on the erythrocyte component of blood
    b) Its mechanism of action is only at the maturation stage
    c) Its function is to increase the amount of erythrocytes in response to an inflammation
    d) Medical use is in treatment of idiopathic or congenital neutrapenia
    e) Its has no adverse effects in clinical setup.

15. Which below is true :-
    a) Neutrophils have a prominent segmented nucleus
    b) Neutrophils have no granules
    c) Esinophils have a been shaped nucleus
    d) Basophils have no granules
    e) Monocytes are small granulated cells

16. Which statement below is false
    a) Plasma is composed of water , electrolytes, plasma proteins, hormones, fats
    b) A red blood cell loses the organelles as it matures
    c) Reticulocytes last in peripheral circulation for about 2 days
    d) Lymphocytes we most numerous in young children
    e) Lymphosafes have a multilobed nucleus

17. The following are hematopoietic organs. Which is not:
    a) Spleen
    b) Liver
    c) Panceas
    d) Lymph nodes
    e) Kidneys

18. Which statement about hematopoiesis is true:
    a) Fetal hematoposiesis starts in the and trimester
    b) Only erythroyles are made in fetal hematopoiesis
    c) The liver is a major haematopoietic organ in adult hood
    d) Yellows marrow of the bones is involved in hematopoiesis
    e) Axial skeleton hardly plays a role in hematopriesis

19. Extrameduary haematopoisesis:
    a) Occurs in a normal physiologically fir adult
    b) Commonest sites are the lynephnodes
    c) Results in hepatispleensmegally
    d) It refers to haematopoiesis that occur within the yellow marrow of the bones
    e) Its always pathologically whether in uterus or in adult hood.

20. Which statement below is true:
    a) A stem cell is a well differentiated cell
    b) Stem cells are always involved in biological activities at all stages
    c) Proliferation results in acquisition of specific character
    d) Apoptosis refers to programmed cell death
    e) Stem cells are not imported in hematopoiesis

21. The stroma: which is false
    a) Also refered to as the Hematopoietic inductive mucus environment
    b) It includes the cells and support tissues
    c) Many growth factors and cytokines are secreted within the stroma
    d) Refers to the hematopoietic organs
    e) Essential for hematopoiesis

22. A good hematopoietic system cant operated without the following except
    a) Iron
    b) Stem cells
    c) Healthy haematopoietic organs
    d) Him
    e) Growth factors

23. Factors that affect eryfropoiesis are some of the following except
    a) Hypoxia
    b) Exerase
    c) Dietary facts
    d) Metal ions e.g. From
    e) Hormonal factors: thyroids hormones

24. Which statement below is true:
    a) Myeloblasts are the last developmental stage of granules poiesis
    b) Myeloblasts can neves be found in the peripheral blood
    c) Myeloblast has moderate number of granules
    d) Myeloblast can differentiate into any of the granulocyle
    e) Monoblast is a committed cell for the granulopoesis

25. Which statement is true about thronebopoiesis :
    a) Megataryoblast is the first developmental stage for thronuhospoiesis
    b) Platelets has a lifespan of 120days
    c) Platelets have no granules
    d) The stem cell thronebopoiesis is promegakaryscyle
    e) There is little or no fragmentation of the cytoplasm

26. Which statements is false about haemoglobin
    a) Synthesis begins in the proerythhrsblest stage
    b) Consists of two parts Haem and globin
    c) Both Haem and globin are produced in the ribosomes
    d) Factors such as vitamin B is required for synthesis of Hem
    e) In formation of Haem, the final step involves insertion of ferrous iron.

27. Which statement is true about globin synthesis:
    a) The β-like cluster is found on the short arm of chromosome 16.
    b) The β-like cluster is found on the short arm of chromosome 14
    c) Globlin synthesis begins in adulthood
    d) Haemoglobin Portland is a type of embryonic Haemoglobin
    e) HbA is a pathological haemoglobin

28. Which below is a false statement
    a) The fetal haemoglobin has globin chains α_2 and δ_2
    b) The adult haemoglobin has globin chains α_2 and β_2
    c) Folding of the globin confers it solubility and rigidity
    d) During oxygenation (reaction of Hb with oxygen) the α chains move closes together
    e) One Hb can bind upto 4 O_2 molecules

29. The following are visual compassion methods for estimation of haemoglobin. Which is not
    a) Spectrophotometric method
    b) WHO haemoglobin color scale
    c) Spencer method
    d) Tulliquist scale method
    e) Acid haematin method

30. The following are source of error in Haemoglobinmetry which is not
    a) Excessive squeezing of finger after pricking
    b) Collection of cultural blood versus collection of venous blood which is prepared
    c) Prolonged use of tourniquet when collecting venous blood
    d) Dirty equipment
    e) Non linearity

SECTION B

1. a) Discuss Erythropoiesis and the factors that affect erythropoiesis **(15marks)**

   b) Write short notes on stem cells **(5marks)**

2. a) (i) Write short notes on the red blood cell indices

   (ii) State the types of anemia that can be classified using the red cell indices **(5marks)**

   b) (i) Discuss fetal and adult hematopoiesis and state the hematopoietic organs

   (ii) Discuss one of the organs in details . **(15marks)**