



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**BACHELOR OF MEDICAL LABORATORY SCIENCES**

**AML 4206 : HAEMATOLOGY I**

**END OF SEMESTER EXAMINATION**

**SERIES:** APRIL 2016

**TIME:** 2 HOURS

**DATE:** Pick Date May 2016

## Instructions to Candidates

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of **TWO** Section(s). Attempt ALL questions.

**Circle the correct answer in section A.**

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1. The following is true about classification of leukocytes
  - a. Phagocytic ability is used for classification
  - b. Cell lineage may also be used for classification
  - c. Immunophenotyping is not used for classification
  - d. Nuclear lobulation can also be used to classify cells
  - e. Overall acidity or alkalinity of cytoplasmic granules is also used
2. The metamyelocyte is a stage for the following cell
  - a. Eosinophil
  - b. Monocyte
  - c. Basophil
  - d. Neutrophil
  - e. T-lymphocyte
3. The following is true concerning the granulocytes except?
  - a. Neutrophils are the first cell line to arrive at the site of infection
  - b. Neutrophilic granules contain alkaline phosphatase
  - c. Neutrophilic beta granules contain bactericidal enzymes
  - d. Charcot-Leyden crystals are found in the neutrophils
  - e. Eosinophil specific granules are cytotoxic

4. T-lymphocytes provide \_\_\_\_\_ immunity
  - a. Cellular
  - b. Mechanical
  - c. Passive
  - d. Cytotoxic
  - e. Dependent
5. Which of the following cells is not active against tumor cells
  - a. T<sub>c</sub>
  - b. NK
  - c. CTL
  - d. T<sub>H</sub>
  - e. NKT
6. The following is not part of the platelet ultra-structure
  - a. a trilaminar membrane
  - b. dense bodies
  - c. glycogen granules
  - d. mitochondrion
  - e. nucleolus
7. The following is true concerning the platelet glycocalyx
  - a. Gives the platelet its ABO specificity
  - b. Gives the platelet its Rh specificity
  - c. Is responsible for platelet antigenicity
  - d. The glycocalyx hosts the platelet transmission receptors
  - e. It is responsible for tissue compatibility
8. The following statements are true concerning the open canaliculi
  - a. It consists of plasma membrane invaginations
  - b. They link internal environment to the surface
  - c. They provide a network for extracellular adhesion
  - d. Provides a way for release of platelet stored products to the surface
  - e. Provides a large surface area for collection of platelet coagulation factors
9. Which of the following is true concerning the microtubules in the Sol Gel area?
  - a. They do not regulate platelet responses
  - b. They surround the circumference of the platelet
  - c. They contain the contractile proteins
  - d. Help in the reorientation of the activated proteins
  - e. Contribute to platelet shape change during activation
10. The following is false concerning the characteristics of growth factors
  - a. Their activity may be hierarchical
  - b. Effect activity prevents progenitor cell apoptosis
  - c. The growth factors occur in very low concentrations
  - d. The activity of growth factors is never synergistic
  - e. Growth factors act on stem, progenitor and end cells

11. The following growth factor activity is directed towards the stromal cells
  - a. TNF
  - b. SCF
  - c. IL-3
  - d. G-CSF
  - e. TPO
12. Thrombopoietin acts on the following cells
  - a. Erythroid progenitors
  - b. Lymphoid precursors
  - c. Promyelocyte
  - d. Pronormoblast
  - e. None of the above
13. The following is true concerning the effects of anticoagulants on white blood cells
  - a. EDTA may suppress platelet degranulation
  - b. Heparin induces leucocyte and platelet clumping
  - c. Neutrophil activity is lowered in EDTA
  - d. EDTA may diminish monocyte activity
  - e. Neutrophil activity does not change with EDTA
14. The following is true concerning heparin anticoagulant activity
  - a. Binds to calcium ions
  - b. Chelates calcium ions in the blood
  - c. Precipitates calcium from the blood
  - d. It binds to thrombin to inhibit coagulation
  - e. Binds to antithrombin to inhibit coagulation
15. Which of the following statements differentiates ACD from Alsever's solution?
  - a. The pH of Alsever's is lower
  - b. The pH of Alsever's is higher
  - c. Dilution of 9:1 is used in both
  - d. Dilution of 4:1 is used in both
  - e. None of the above is correct
16. The following is true concerning the effects of storage on the blood count regardless of anticoagulant choice
  - a. Blood counts are only stable within 1 hour
  - b. On storage at 4°C changes are significant only after 72 hours
  - c. Red blood cells normally swell after 8 hours of storage affecting the ESR
  - d. Leucocyte numbers are reliable up to 24 hours of standing
  - e. Osmotic fragility of stored cells is normally lower than when done immediately
17. Inappropriate handling of blood prior to transfer to the lab may cause the following except?
  - a. Haemolysis
  - b. Partial lysis
  - c. Cell disintegration
  - d. Patient infection
  - e. Partial coagulation

18. The following is not a Protozoan parasites that will occur as an inclusion
- Plasmodium*
  - Babesia*
  - Encephalitozoon*
  - Neigleria*
  - Enterocystozoon*
19. The following conditions may present with toxic granulation of neutrophils
- Septicemia
  - Acute inflammation
  - Infectious disease
  - Immune disease
  - None of the above
20. What are dohle bodies?
- Aggregates of plasma
  - Aggregates of the nucleus
  - Aggregates of ribosome or rough endoplasmic reticulum
  - Collection of blue stains eccentrically
  - These are metamyelocytes in circulation
21. Platelet satellitosis occurs as a result of the following
- EDTA anticoagulant
  - Red cell aggradation
  - White cell adherent ability
  - Increase in blood viscosity
  - Platelet antigen activity
22. Molecules that may be used for gaseous exchange include the following except?
- Haemoglobin
  - Cytochrome
  - Myoglobin
  - Chlorophyll
  - Carotene
23. The following is not a building block for haemoglobin synthesis
- Protoporphyrin
  - Amino acids
  - Oxygen
  - Iron
  - Pyrolle
24. Globins that make up heme are formed in the following organelle
- Nucleus
  - Nucleolus
  - Cytoplasm
  - Ribosome
  - Mitochondrion

25. Which of the following does not belong to the beta cluster of globin forming genes
- Beta gene
  - Delta gene
  - Zeta gene
  - Epsilon gene
  - Gamma gene
26. The Beta cluster of globin forming genes is situated on which chromosome
- 1
  - 6
  - 11
  - 22
  - X
27. The following haemoglobin is only found in adults
- Hb F
  - Hb Portland
  - Hb Gower I
  - Hb Gower II
  - Hb A<sub>1</sub>
28. The following is true concerning the peripheral blood smear preparation
- The slide holding the blood should be on a flat surface
  - The pusher slide is held at an angle of 30°
  - The spreading motion must be quick swift and gliding
  - The smear made should form a wedge shape
  - The pusher slide is held at 90° then this is gradually decreased with the spreading
29. The following precautions are observed when spreading
- Even pressure on the slide/cover slip
  - Ensure whole drop is picked
  - The spreading speed should not be slow
  - If Hct is low increase the angle
  - Ensure the smear made is always thick
30. In haematology, Radioisotopes are used in the investigation of the following except?
- megaloblastic anaemia
  - red cell life span
  - spleen pool
  - hematocrit
  - plasma volume

**SECTION B**

**Question thirty one**

- a. Describe in detail the final five stages of immature red cell maturation (10mks)
- b. Discuss calibration of automated equipment (10mks )

**Question thirty two**

- a. Define flagging and list types of flags in an automated report (10mks)
- b. With examples, explain the following
  - i. Anisocytosis (4mks)
  - ii. The three stages of foetal haematopoiesis (6mks)