



TECHNICAL UNIVERSITY OF MOMBASA

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.

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_C
 - b. NK
 - c. CTL
 - d. T_H
 - 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 A₁
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)