



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF APPLIED AND HEALTH SCIENCES

DEPARTMENT OF MEDICAL SCIENCES

**UNIVERSITY EXAMINATION FOR:**

**DIPLOMA IN MEDICAL LABORATORY SCIENCES**

**AML 2207 : HAEMATOLOGY II**

**SPECIAL/SUPPLEMENTARY EXAMINATION**

**SERIES: AUGUST 2017**

**TIME: 2 HOURS**

**DATE:** Pick Date Sep 2017

## **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 features may correspond to states of haemochromatosis except?
  - a. Siderotic granules
  - b. Increased serum iron
  - c. Decreased serum iron
  - d. Haemosidenuria
2. The decrease in Red Cell Mass is known as?
  - a. Leukemia
  - b. Polycythemia
  - c. Anaemia
  - d. Haemochromatosis
3. Relative polycythemia refers to the following
  - a. Increased Red Cell Mass
  - b. Decreased Red Cell Mass
  - c. Increased Plasma volume
  - d. Decreased Plasma volume

4. Packed Cells Volume (PCV) values may be used to confirm the following
  - a. M.CV
  - b. Haemoglobin
  - c. WBCS
  - d. Platelets
5. Which of the following is a method for blood cell counting
  - a. Colorimetric
  - b. Neubauer
  - c. Sahli
  - d. Spencer and spenser
6. The following is an aqueous haematological stain
  - a. Field's stain
  - b. Jenner's
  - c. Giemsa
  - d. Leishman's
7. The following statements are true of Rouleaux except
  - a. Is prominent in multiple myeloma
  - b. May result in faster and increased ESR
  - c. Does not make it difficult to make satisfactory thin films
  - d. Spherocytic cells may form long chains of rouleaux
8. A Codocytes is also known as a Mexican hat cell and is characteristically found in
  - a. Thalassaemia
  - b. Anaemia of chronic disease
  - c. Iron deficiency anaemia
  - d. Liver disease
9. The following statements is true regarding ESR
  - a. May be normal in sickle cell anaemia
  - b. May be lowered by over-anticoagulation
  - c. Inadequate mixing does not constitute a major source of error
  - d. Normal levels for males is not 5 – 15mm/hr (Westergren)
10. HbA<sub>2</sub> has the following globin chains
  - a. 2 $\alpha$  2 $\gamma$
  - b. 2 $\lambda$  2 $\delta$
  - c. 2 $\alpha$  2 $\zeta$
  - d. 2 $\beta$  2 $\gamma$
11. Leishman stain is left to ripen
  - a. For between 7days to 6months
  - b. To sediment the undissolved stain
  - c. To improve staining quality
  - d. At 50<sup>0</sup>C for 15minites

12. At 5% dilution of Giemsa stain the correct staining period for blood cells would be?
- 5 – 10mins
  - 10 – 30mins
  - 30 – 120mins
  - 2 – 24hrs
13. The buffer used in Wrights stain is normally
- pH 6.5
  - pH 7.2
  - pH 6.8
  - pH 7.0
14. When using the Giemsa-MayGrunwald panoptic stain
- Fixation is achieved upon staining with MayGrunwald stain
  - Fixation is achieved by use of absolute alcohol
  - Different staining and differentiation times are used for blood and bone marrow specimen
  - Giemsa stain is used at a concentration of 2%
15. The following are not advantages of EDTA over other anticoagulants
- Tends to add more salt to the specimen
  - Does not clump platelets
  - Does not destroy cell morphology
  - It is not expensive
16. Diluents for RBC include the following except
- Formal citrate
  - Ammonium oxalate
  - Drabkin's solution
  - Toisson's fluid
17. When capillary tubes are heat fixed when performing PCV
- Red cells are not damaged
  - Haemolysis may occur
  - PCV may be increased
  - Red cells are distorted

18. The equivalent of one Picogram is?
- $1.0 \times 10^{-9}$ grams
  - $1.0 \times 10^{-6}$ grams
  - $1.0 \times 10^{-12}$ grams
  - $1.0 \times 10^{-15}$ grams
19. The following may lead to errors in manual white cell counts except
- Clots and clumps
  - Incomplete lysing of red cells
  - White cell aggregation
  - Correct venepuncture
20. Mature normal RBCs may have a diameter of
- 5 - 6 $\mu$ m
  - 6 - 8 $\mu$ m
  - 8 - 10 $\mu$ m
  - 5 - 6.5 $\mu$ m
21. The central area of the improved neubauer is divided into 400 small squares each measuring
- 0.025mm<sup>3</sup>
  - 0.0002mm<sup>2</sup>
  - 0.0004mm<sup>2</sup>
  - 0.0025mm<sup>2</sup>
22. The following statements are true of ESR techniques
- Westergren is more sensitive to low ESR
  - Winthrobe requires more dilution
  - Westergren requires less blood than winthrobe
  - Automated systems are less hazardous but expensive
23. The micro ESR method is also known as?
- Lee-White
  - Cole-Brooks
  - Landau-Adams
  - Scholl-Martins
24. The transfer of O<sub>2</sub> across tissue membranes is via
- Myoglobin
  - Cytochrome
  - Haemoglobin
  - Transfferin

25. Approximately 28% of total RBC volume is made up of
- Lipids
  - Antigens
  - Hemoglobin
  - Haptoglobin
26. The following cells may be found in the blood stream except
- RBCs
  - Basophils
  - Osteoclasts
  - Monocytes
27. Given that the total number of cells counted in each corner squares is 18, 22, 19, 24 WBCs and a dilution factor of 20 was used the WBCs count is
- 4150cells/ltr
  - 4150cells/ $\mu\text{m}^2$
  - $8.3 \times 10^9$ cells/ltr
  - $4.15 \times 10^9$ cells/ltr
28. The following is true of polycythemia
- It may preclude leukaemia
  - $1^0$  polycythemia is caused by stress
  - Relative erythrocytosis is a malignancy
  - True polycythemia may not be a malignancy
29. Vital stains
- are non-toxic to tissue
  - are toxic to tissue
  - do not destroy cellular architecture
  - are not commonly used in haematology
  - maintain tissue in a dead like manner
30. Intravital stains maybe used in
- Demonstration of plasma volume
  - Demonstration of bone marrow
  - Estimation of cell life span
  - Labeling of cells within the body
31. The most commonly used red cell labels are
- $^{51}\text{Cr}$
  - $^{18}\text{C}$
  - $^{16}\text{N}$
  - $^{59}\text{Fe}$

32. Radio iron may be used in preference to Chromium
- Due to the high chromium elution rate
  - When estimating RBC life span
  - Due to the low Chromium elution rate
  - In leucocyte counts
33. Macrocytosis may be found in the following conditions
- Iron deficiency anaemia
  - Folate deficiency
  - Lead poisoning
  - Blood loss anaemia
34. The following statements are not true concerning Cabot rings
- There appear as rings or figures of eight
  - Cabot rings are found in lead poisoning
  - They occur as a result of dyserythropoiesis
  - They are a manifestation of Protozoan infections
35. Drabkin's solution contains the following except?
- Potassium cyanide
  - Potassium ferricyanide
  - Sodium hydroxide
  - Calcium chloride
36. The following is/are not normal adult globulins
- Alpha
  - Gamma
  - Delta
  - Epsilon
37. Reticulocytes when stained by Romanowsky stains appear?
- Normochromic
  - Polychromic
  - Metachromic
  - Orthochromic
38. An absolute increase in reticulocyte count has the following significance
- A decrease in RBC production
  - A decrease in RBC production
  - A marked increase in polychromatophilic staining cells
  - A normal RBC pattern
39. Normocytic normochromic anaemias mainly occur as a result of the following
- Decreased red cell destruction
  - Increased red cell destruction
  - Non-hemolytic causes of anaemia
  - There are no incidences of Normocytic normochromic anaemia

40. Cells having an eccentric hallow area resembling a woman’s handbag are referred to as?
- Tear drop cells
  - Target Cells
  - Prekeratocytes
  - Keratocytes

Section B

41. Answer the following questions on Red Cell Indices and ESR

- a. Using the following values calculate Red Cell Indices (14mks)
- MCV,
  - MCH,
  - MCHC

Parameter	Value
RBC count	$3.8 \times 10^{12}$ Cells/ litre
Hb conc.	13.2grms/dL
PCV	37.3%

- b. Discuss the significance of the ESR test (6mks)
42. Discuss haemoglobinopathies (20mks)
43. Outline the procedure for the following techniques and give normal range values
- Reticulocyte count (10mks)
  - Discuss the characteristics of Romanowsky stains (10mks)