



TECHNICAL UNIVERSITY OF MOMBASA

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.

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. HbA₂ has the following globin chains
 - a. 2 α 2 γ
 - b. 2 λ 2 δ
 - c. 2 α 2 ζ
 - d. 2 β 2 γ
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 50⁰C for 15minites

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

18. The equivalent of one Picogram is?
- 1.0×10^{-9} grams
 - 1.0×10^{-6} grams
 - 1.0×10^{-12} grams
 - 1.0×10^{-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 μ m
 - 6 - 8 μ m
 - 8 - 10 μ m
 - 5 - 6.5 μ m
21. The central area of the improved neubauer is divided into 400 small squares each measuring
- 0.025mm³
 - 0.0002mm²
 - 0.0004mm²
 - 0.0025mm²
22. The following statements are true of ESR techniques
- Westergren is more sensitive to low ESR
 - Winthrope requires more dilution
 - Westergren requires less blood than winthrope
 - 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 O₂ 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/ μm^2
 - 8.3×10^9 cells/ltr
 - 4.15×10^9 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}Cr
 - ^{18}C
 - ^{16}N
 - ^{59}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
- They 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 accentric 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	3.8×10^{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)