Candidate number.....

"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

DEPARTMENT OF HEALTH SCIENCES

SLS 408 HAEMATOLOGY THEORY

END OF SECOND SEMESTER SUPPLEMENTARY EXAMINATIONS

APRIL/MAY 2019

LECTURER: DR MABOREKE

DURATION: 3 HOURS

INSTRUCTIONS

Write your candidate number on the space provided on top of each page
Answer **all** questions in sections A on the question paper.
Answer **all** questions in section B on separate answer sheets provided.
Answer any **6** questions in section C on separate answer sheets provided
Credit will be given for logical, systematic and neat presentations in sections B and C

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Sections A(40 marks)

Answer all questions by indicating T for TRUE or F for FALSE in front of each of the statements (a) to (d) in all the questions

1. **Regarding FBC analyser technology**
   a) Forward light scatter is proportional to cell size
   b) Side light scatter is proportional to cell complexity
   c) Cell complexity refers to degree of lobularity and granularity of the cell
   d) A lymphocyte is a complex cell

2. **Which of the following conditions usually shows a high RDW?**
   a) Sickle cell anaemia
   b) Iron deficiency anaemia
   c) Megaloblastic anaemia
   d) Thalassaemia trait

3. **Which of the following are causes of microcytic hypochronic anaemia**
   a) Iron deficiency
   b) Thalassaemia trait
   c) Early anaemia of chronic disease
   d) Vitamin B12 deficiency

4. **Which test can be used to confirm iron deficiency?**
   a) Serum ferritin
   b) Serum iron and Transferin
   c) Zinc protoporphyrin
   d) Serum iron alone is a reliable test

5. **Regarding Myeloproliferative neoplasms,**

a) JAK2 mutation is positive in 100% of cases of polythemia Vera
b) JAK2 mutation is positive in just over 50% of cases of Essential thrombocythemia and just over 50% of primary myelofibrosis
c) Leukocythroblastic picture with teardrop poikilocytosis is a typical finding on blood film of a patient with primary myelofibrosis.
d) CALR and MPL mutations are found in a small proportion of patients with Essential thrombocythaemia and primary myelofibrosis

6. Regarding accurate diagnosis of acute Leukaemia,

a) Auer rods confirm diagnosis of Acute myeloid leukaemia
b) Flow cytometric immunophenotype is most useful test
c) Cytogenetics can be diagnostic and prognosticative
d) t(8:21) t(15:17) and inV16 are good prognostis cytogenetic features

7. Regarding neutropenia

a) Severe neutropenia refers to absolute neutrophil count of less than 0.5x109/L
b) Prolonged severe neutropenia is that which lasts for more than seven days
c) Patients with severe neutropenia are prone to serious infections
d) Clinical features of neutropenia include recurrent infections and recurrent mouth ulcers

8. Regarding Acute Leukaemia,

a) Onset of illness is insidious
b) Predominant cells are blasts on blood or bone marrow aspirate film examination.
c) Acute lymphoblastic Leukaemia (ALL) is more common in children than adults
d) Acute myeloid leukaemia (AML) is more common in children than adults

9. About chronic myeloid leukaemia,

a) On blood or marrow aspirate film exam
-all neutrophil precursors are represented but with predominant cells being mature neutrophils and myelocytes
b) The cytogenetic marker is t(9:22) resulting a fusion gene.
c) The fusion gene is BCR/ABL
d) The diagnostic fusion gene is detected and quantified by polymerase chain reaction (PCR)

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10. Which of the following tests are part of the clotting screen?

a) PT

b) FVIII assay

c) aPTT

d) Platelet count

11. A two year old boy has the following coagulation test results

- PT13 secs (10-14)
- APTT 50 secs (27-43)
- FBC normal
- aPTT after 50/50 mix with normal plasma = 35 secs

Which factor assays do you do to detect the deficiency?

a) FVIII

b) FVII

c) FV

d) F IX

12. Subclassification of anaemia based on MCV include:

a) Macrocytic hypochromic

b) Microcytic hyperchromic

c) Normocytic hypochromic

d) Microcytic hypochromic

13. Which are the features of low grade non-Hodgkin's lymphoma?

a) Slow onset of presentation

b) Cells are usually small on microscopic examination

c) Cells are slowly dividing

d) Usually curable

14. RDW is a quantification of:

a) Microcytosis

b) Poikilocytosis

c) Anisocytosis

d) Red cell dilution with water

15. **Regarding Hodgkin's Lymphoma (HL),**
    a) It is of B cell origin
    b) The diagnostic neoplastic cells is the Reed-Sternberg cell in classical Hodgkin lymphoma
    c) Blood film examination is useful in making a diagnosis
    d) Immunohistochemistry is useful for accurate diagnosis and distinguish between classical HL and nodular lymphocyte predominant
16. **Thrombin time (TT) is used mainly to evaluate the level and function of**
    a) Fibrinogens
    b) Heparin contamination of blood sample where it is prolonged but reptilase time is not prolonged
    c) FVIII
    d) None of the above

17. **Which of the following are features of High grade non-Hodgkin's lymphoma?**
    a) Cells are usually large
    b) Cells are rapidly dividing
    c) High lactic dehydrogenate (LDH) indicates high disease bulk
    d) Potentially curable.

18. **Causes of eosinophilia include the following,**
    a) Parasitic infestations
    b) Atopic disease
    c) Viral infection
    d) Bleeding

19. **The components of good Quality Management System (Quality Assurance) include**
    a) Inspections from the international standards Organization (ISO)
    b) External quality assessment
    c) Internal Quality Control activities
    d) Continuous Quality Improvement Activities

20. **Which of the following blood film features are suggestive of infection?**
    a) Increased rouleaux

b) High ESR or CRP

c) Neutrophilia with left shift and toxic granulations, vacuolations and Dohle bodies

d) Peudo Pelger Huet neutrophils

SECTION B (20 marks)

Answer all questions
Each question carries 5 marks

1. A 6 year old boy presents with yellow eyes. FBC shows WBC 9.4 Hb 6.5 MCV 101 Plt 170 Reticulocyte count 6% Blood film shows spherocytosis. Total bilirubin 48 (2-22)
   a) List 3 possible causes of spherocytosis.
   b) What single test do you do to narrow the diagnostic posibilities.

2) A 7 year old girl has acute leukaemia with more than 50% blasts on blood film and bone marrow film. However the haematologist cannot on microscopic examination say whether this is acute myeoid leukaemia (AML) or acute lymphoblastic leukaemia (ALL)
He requests cytochemistry.

Please match (use arrow) each cytochemical stain on the left with the leukaemia it detects

a) Sudan Black	i) ALL
b) Myeloperoxidase	ii) Monocytic AML
c) PAS	iii) AML
d) Non specific Esterase	iv) T- ALL
e) Acid phosphatsse	

3) A 60 yr old lady comes to hospital with tiredness from anaemia. WBC 3.1 Hb 5.2 MCV 119 Plt 101

a) What are the possible causes of such an anaemia

b) What further tests do you suggest to confirm the cause

4. (a) What are the two screening tests for sickle cell disease.

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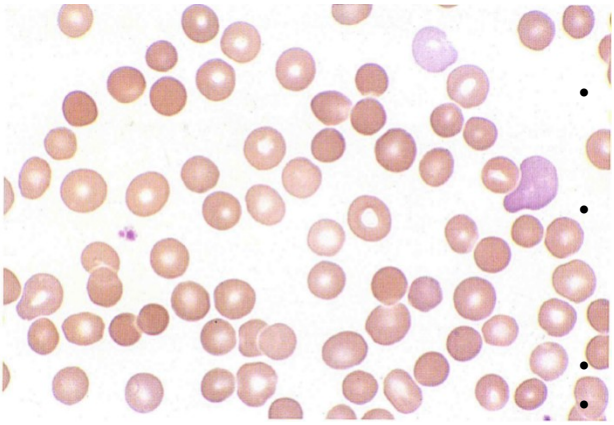
(b) List the tests used to confirm the phenotype of sickle cell disease.

SECTION C (60 marks)

Answer any six cases on separate answer sheets provided.
Each case carries 10 marks.

Case 1

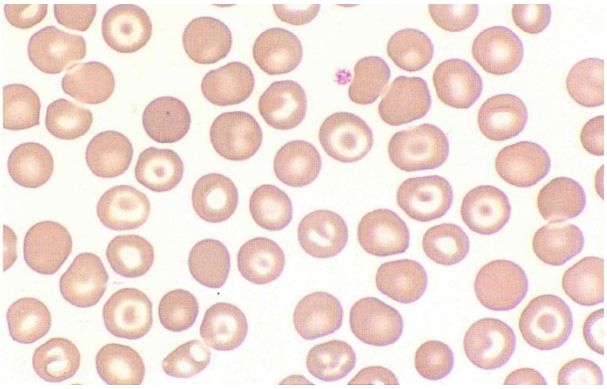


- A 22 Year old female presents with history of galls stones.
- FBC: Hb 13,4 g/dl, MCH 91fL , MCH 34,6 pg, MCHC 37,1 g/dl, RDW-CV 14,8%, WBC 8,4 x10 9/L, Plt. 377 x10 9/L

A 45 year old male found collapse on the flour and 3 bottles of chibuku next to him.

- FBC: Hb 15,1 g/dl, MCV 99,8fL, MCH 34,4 pg, MCHC 34,3 g/dl, RDW-CV 15,5 %, WBC 11,1 X10 9/l, Plt 71 x 10 9/L: Normal Diff
- 1) Report on the blood film.
- 2) list possible causes of the abnormality
- 3) What further test do you recommend to narrow your diagnostic possibilities

Case 2



- 1-Report on this blood film
- 2-list 3 possible causes of the abnormality
- 3-What further test do you recommend to narrow your diagnostic possibilities

Case 3

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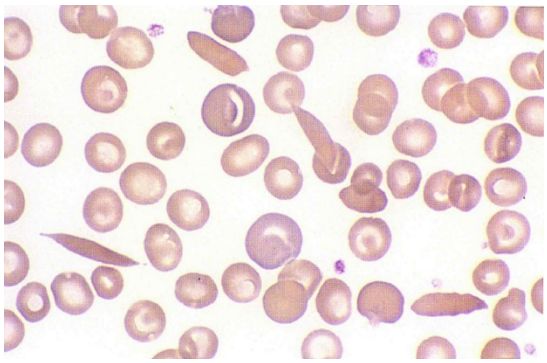
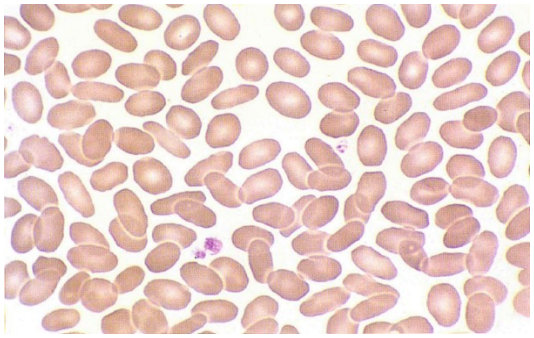


- A 47 year old male from Ghana with severe bone pain
- FBC: Hb 9,2 g/dL, MCV 89,5fL, MCH 30,2pg,RDW-CV14,9%,Retc.CT5,9%,WBC 15,2 x 10 9/L, Plt 600 x 10 9/L,NBRC 4/100 WBC, Diff: ANC 8,1 x 10 9/L
- 1) Report on the blood film?
- 2) what is your diagnosis
- 3) What are the 2 screening tests for this condition
- 4) what 4 different test are available to confirm the phenotype of this condition

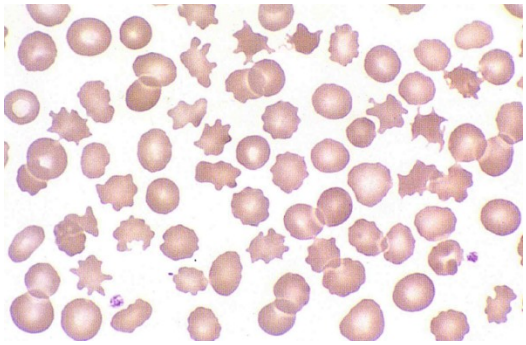
Case 4



- A 37 Year old female preoperative blood test .
- FBC 12,5 g/dL,MCV 86,3fL,MCH29,6pg,MCHC34,2g/dL,RDW-CV14,5%,WBC 11,0 x 10 9/L, Plt 204 x 10 9/L. Diff ANC 8,8 x 10 9/L
- 1-Report on the blood film?
- 2-What is your diagnosis?
- 3-what further test do you recommend?

Case 5

- A 95 year old female febrile and not passing urine
- FBC: Hb 11,8 g/dL, MCV 92,1fL,MHC 31,0pg,MCHC 33,6g/dL,RDW-CV15,9%,WBC 17,8 x 10 9/L, Plt 138 x 10 9/L. Diff ANC 16,7 x 10 9/L



- 1-Report on the blood film?
- 2-What do you think is the diagnosis?
- 3-what biochemical test do you do to confirm your diagnosis?

Case 6

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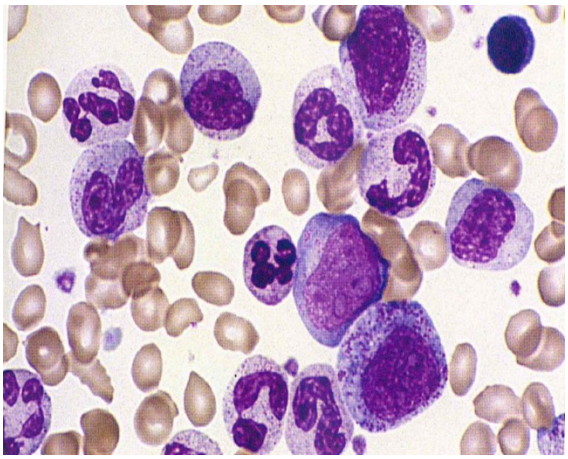
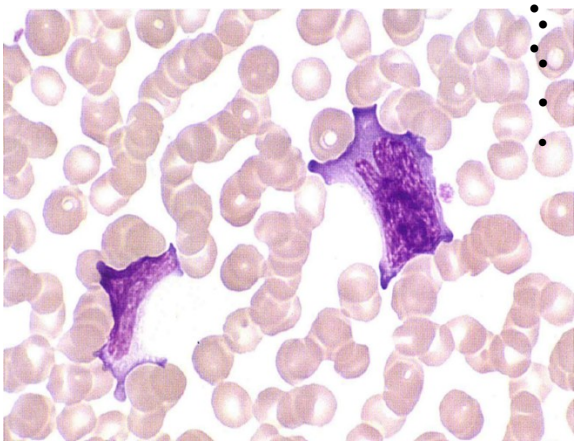


- A 64 year old male presents with lassitude anaemia and massive splenomegaly.
- FBC: Hb 10,4 WBC 170,6, PLT 338, ANC 76,8, ALC 3,4, AMC 5,1,AEC 5,1,ABC 13,6. 1-

- 1) Report on the blood film?
- 2-What do you think is the diagnosis?
- 3-what test do you recommend to confirm the diagnosis

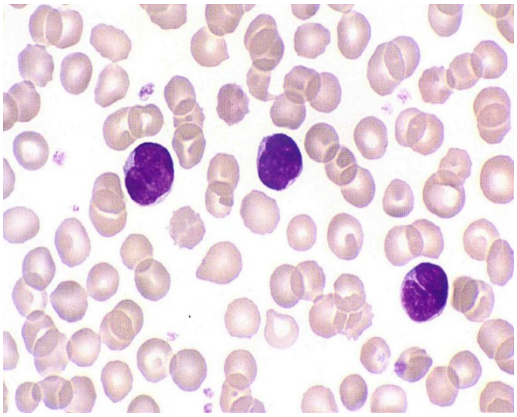
Case 7



- A 6 year old boy with a cough admitted in ICU
- FBC :Hb 10,2 WBC 16,2, PLT 643 ALC 12,4
- A 31 year old male with a superficial eruption of macular transparent vesicles on his back.
- FBC: Hb 16,4, WBC 10,5.PLT 148
- 1-Report on white cells, red cells & platelets?
- 2-list the virus than can cause such a picture?
- 3-what test do recommend to confirm the causes?

1-Report on the blood film?
2-What is thelikely cause of the lymphocytosis?
3-what further test do you do to confirm the cause of caugh?

Case 8



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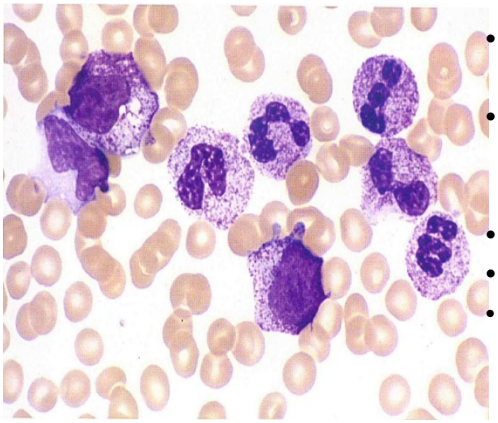
Case 9



- A 6 month infant receiving chemotherapy for neuroblastoma.
- FBC: Hb 10, MCV83,MCH 28,2, RDW-CV 15,9, WBC 38,6, PLT 69,ANC 27,8, ALC 1,9,AMC 4,2.

- 1-Report on the blood film?
- 2-What is thelikely cause of this picture?
- 3-what further microbiological tests do you recommend to confirm diagnosis?