"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

DEPARTMENT OF HEALTH SCIENCES

SLS 408 HAEMATOLOGY THEORY

END OF FIRST SEMESTER EXAMINATIONS

APRIL/MAY 2018

LECTURER: P NAGO

DURATION: 3 HOURS

INSTRUCTIONS

1. Do not write your name on the answer sheet
2. Use Answer Sheets Provided
3. Begin your answer for Each Question in Section C on a New Page
4. Credit is Given for Neat Presentation

Section A: (40 Marks)

Answer ALL questions in this Section by writing the correct response T or F

1. The RBC index that is used to describe average RBC volume is the :

T F (A) RDW

T F (B) MCV

T F (C) MCH

T F (D) MCHC

2. When anemia is long- standing which of the following is among the body adaptation mechanism?

T F (A) Reduced respiratory rate

T F (B) Reduced oxygen affinity of Hb

T F (C) Lower heart rate

T F (A) Reduced volume of blood ejected from the heart with each contraction

3. Which of the following is detected only by examination of peripheral smear?

T F (A) Microcytosis

T F (B) Anisocytosis

T F (C) Poikilocytosis

T F (D) Hypochromia

4. Sings & symptoms of anemia range from slight fatigue or barely noticeable physiologic changes to life-threatening reactions depending on :

T F (A) Rate of onset

T F (B) Severity of blood loss

T F (C) Ability of the body to adapt

T F (D) All of the above

5. A peripheral blood smear that has an erythrocyte mixture of macrocytes, microcytes & normocytes present can best be described by :

T F (A) Poikiloctosis

T F (B) Poly chromatophilia

T F (C) Megaloblastosis

T F (D) Anisocytosis

6. If there is an increase in macrocytic polychromatophilic erythrocytes on the Romanowsky stained blood smear, what laboratory test should you correlate this with?

T F (A) Serum bilrubin

T F (B) Reticulocyte count

T F (C) Leukocyte count

T F (D) MCHC

7. Polycythemia Vera (PV) can be distinguished from secondary Polycythemia by measuring :

T F (A) Haematocrit

T F (B) Plasma volume

T F (C) Haemoglobin concentration

T F (D) Oxygen saturation

8. A 50 year-old man was admitted to the emergency room for chest pains, & a full blood count was ordered. The results showed: red blood cell count $6.5x10^{12}$/l; HCT 60%; white blood cell count $15x10^{9}$/l; platelet count $500x10^{9}$/l.

   These results indicate:

T F (A) The need for further investigation of a possible diagnosis of MPD /MPN

T F (B) Normal findings for an adult male

T F (C) The patient has experienced a thrombotic episode

T F (D) A malfunctioning of the cell counting instrument

9. Signs of anemia obtained by physical examination include the following:

T F (A) Hypotension

T F (B) Bone deformities

T F (C) Koilonychia

T F (D) Glossitis

10. What test can help you determine if an elevated haematocrit is due to relative polycythemia?

T F (A) HCT

T F (B) MCV

T F (C) Determine the total red cell mass

T F (D) Haemoconcentration

11. Hodgkin's lymphoma is a malignant of:

T F (A) B cell origin

T F (B) T cell origin

T F (C) Erythrocyte origin

T F (D) All of the above

12. When comparing acute & chronic leukaemias:

T F (A) The clinical onset of chronic leukaemia is sudden

T F (B) The clinical onset of acute leukaemia is insidious

T F (C) The predominant cells in acute leukaemia are blasts & some mature forms yet in the chronic leukaemia are mature forms.

T F (C) The predominant cells in acute leukaemia are blasts & some mature forms yet in the chronic leukaemia are blast forms

13. Major classes of myeloid neoplasms:

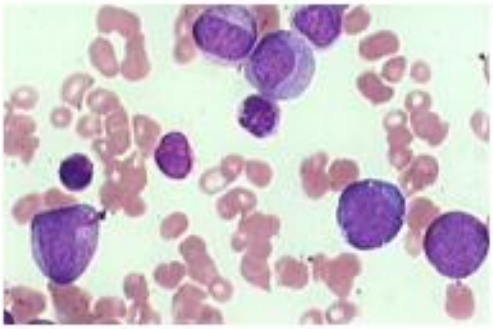
T F (A) MDSs

T F (B) MPNs

T F (C) Acute leukaemia

T F (D) None of the above

14. The peripheral blood picture below shows:



T F (A) Absence of left shift

T F (B) Severe left shift

T F (C) Moderate to severe left shift

T F (D) None of the above

15. Which cell is characterized by the following features?

- ✓ 15 to 20µm in diameter
- ✓ Delicate nucleus with prominent nucleoli
- ✓ Stains positive with myeloperoxidase

T F (A) Monocyte

T F (B) Myelocyte

T F (C) Lymphocyte

T F (D) Myeloblast

16. Various anaemias have common manifestations. Careful questioning of the patient may reveal contributing factors such as:

T F (A) Diet

T F (B) Medications

T F (C) Occupational hazards

T F (D) Ethnicity

17. Sub classification of anemia based on MCV includes:

T F (A) Normocytic, Normochromic

T F (B) Macrocytic

T F (C) Tricky

T F (D) Microcytic, hypochromic

18. Anaemia due to extra corpuscular abnormalities includes the following which are mechanical:

T F (A) MAHA

T F (B) TTP

T F (C) HUS

T F (D) Traumatic cardiac hemolytic anemia

19. Absorption of vitamin B12 depends on production of intrinsic factor by parietal cells of the:

T F (A) Liver

T F (B) Bone marrow

T F (C) Stomach

T F (D) Spleen

20. In primary haemostatic plug formation, platelet involvement is:

T F (A) Release of ADP

T F (B) Thromboxane A2 generation

T F (C) Apoptosis

T F (D) Adhesion

Section B: Answer <u>all</u> questions: (Each question carries 5 marks)

1. Explain why the thrombin time will be abnormal in patients with afibrinogenomia & dysyfibrinonogememia
2. List five examples of Myeloproliferative Neoplasms?
3. In the field of coagulation, define an Agonist , & give three examples
4. What conditions lead to 'secondary' polycythemia?

Section C (Answer three questions, each question carries 20 marks)

1.

An 85 year old slender, frail Caucasian woman was hospitalized for diagnosis & treatment of anemia suspected during a routine examination by her physician. The physician noted that she appeared pale and inquired about fatigue and tiredness. Although she generally felt well, the patient admitted to feeling slightly tired when climbing stairs. A hematocrit (Hct) performed in the physician's office showed a dangerously low value, so she was hospitalized for further evaluation. Her CBC results are as follows:

Parameter	**Patient**	**Reference range**
WBC	8.5 $x10^3/\mu L$	4.5-11 ($x10^3/\mu L$)
RBC	1.66 $x10^6/\mu L$	4.3-5.9 ($x10^6/\mu L$)
Hb	3.0 g/dL	13.9-16.3 (g/dL)
HCT	11 %	39-55 %
MCV	63 fL	80-100 (fL)
MCH	18.1 pg	25.4-34.6 (pg)
MCHC	28 g/dL	31-37 g/dL
RDW	20 %	11.5-14.5 %
Platelet count	165 $x10^3/\mu L$	150-400 ($x10^3/\mu L$)
WBC differential	Unremarkable	
RBC morphology	Marked anisocytosis Marked poikilocytosis Marked hypochromia Marked microcytosis	

a. What conditions should you consider based on the results of the CBC?(5marks)

b. Assuming that this patient has not been diagnosed with anemia at any other time during her life, are any of the conditions listed in the answer to question (a) more likely based on the patient's age or gender? (5marks)

c. Assuming that the patient is otherwise healthy and is experiencing only the common declines in sight, hearing, and mobility associated with aging, are any of the conditions listed in the answer to question 1 more likely than the others? (5marks)

d. What additional testing would you recommend? What results do you expect for this patient? (5marks)

2.
i) Renal tumors may produce an inappropriate amount of EPO, resulting in what type of polycythaemia? (6marks)

ii) Which of the following conditions are associated with an absolute increase in RBC mass? Iron deficiency, smoking, emphysema, pregnancy, dehydration. Briefly explain (8marks)

iii) What is the differential diagnosis of a high haematocrit level? (6marks)

3. How does typical peripheral blood picture in MDS differ from aplastic anemia? (20marks).

4. Why is the bleeding time test abnormal following ingestion of aspirin, and why does it take up to 7 days to normalize? (20marks)

5.

(a) Why do you think malaria & babesiosis result in anemia? (5 marks)

(b) List five examples of clinical features of malaria (5marks)

(c) Mention 5 important laboratory tests to be done on a patient suspected of malaria & briefly explain why. (10marks)