



# TECHNICAL UNIVERSITY OF MOMBASA

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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.**

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1. The following is a direct progenitor cell arising from the Pluripotential haematopoietic stem cell
  - a. T-cell
  - b. Myeloid stem cell
  - c. Myelocyte stem cell
  - d. Erythroid stem cell
  - e. Megakaryoblast
2. Plasma cells are differentiated end stage cells arising from the following
  - a. Monocytes
  - b. T-lymphocytes
  - c. B-Lymphocytes
  - d. Lymphoblast
  - e. Megakryoblast
3. The following is true concerning cytokines except
  - a. They are strictly lineage specific
  - b. Are produced from T-lymphocytes
  - c. Are produced from monocytes
  - d. IL-3 is multi-lineage
  - e. Some cytokines are lineage specific

4. The following statement is true concerning the monocytes
  - a. Maturation is regulated by the GM-CSF
  - b. Stages of monocyte maturation include monoblast & promonocyte
  - c. Monocytes when released from the bone marrow continue to enlarge in tissues
  - d. Monocytes are only found in blood circulation
  - e. Monocytes are found in other tissues such as liver and spleen
5. The following is not a function of monocytes
  - a. They secrete cytokines
  - b. They act as antigen presenting cells
  - c. They are antibody producing cells
  - d. They are phagocytic
  - e. They filter antigens for T-cells
6. Which of the following is true concerning antigen independent lymphopoiesis
  - a. It occurs in the primary lymphoid organs
  - b. Develop into immunocompetent T and B cells
  - c. Are part of the heterogenous lymphocyte population
  - d. They reenter bone marrow and repopulate it
  - e. They enter secondary lymphoid tissue and populate them
7. The following are properties of T-cells except
  - a. They constitute 80% of blood lymphocyte pool
  - b. Express antigen CD2, CD3 and CD4 among others
  - c. Does not express CD8
  - d. They develop in the thymus
  - e. The end products of their activation are cytokines
8. The end products of B-Cell activation is?
  - a. Cytokine
  - b. Chemokine
  - c. CD19
  - d. Antibody
  - e. Antigens
9. Alpha granules contain platelet specific granules. These include the following
  - a. Platelet derived growth factor
  - b. Fibrinogen
  - c. Von Willebrand factor
  - d. Dense bodies
  - e. Catecholamines
10. Which of the following is true concerning platelet function ?
  - a. They nurture endothelial cells
  - b. They fill the endothelial gaps
  - c. They help in the formation of a platelet plug
  - d. Help in the maturation of blood vessels
  - e. They are able to maintain a vascular integrity

11. The following is true of growth factors
  - a. Stimulates apoptosis
  - b. Prevents maturation
  - c. Encourages apoptosis
  - d. Stimulates cell aggregation
  - e. Stimulates cell maturation
12. The following anticoagulants remove calcium except?
  - a. EDTA
  - b. Sodium citrate
  - c. Heparin
  - d. Acid Citrate Dextrose
  - e. Citrate Phosphate Dextrose
13. EDTA may be used in the following concentration
  - a. 1.5mg/ml of blood
  - b. 1.0mg/ml of blood
  - c. 16gms/ltr of blood
  - d. 2.0gms /ml of blood
  - e. None of the above
14. The following is not a bad effect of excess EDTA
  - a. Causes cell shrinkage
  - b. Causes a decrease in the PCV
  - c. Leads to platelet swelling and disintegration
  - d. Chelates calcium
  - e. May cause an artificial increase in platelet count
15. Which of the following statement is false concerning anticoagulants use in coagulation studies
  - a. Trisodium citrate is preferred
  - b. The ratio of anticoagulant to blood is critical
  - c. Any free calcium ions may cause critical changes in the coagulation time
  - d. The ratio of volume of blood to anticoagulant is 1: 9
  - e. The ratio of volume of blood to anticoagulant is 9: 1
16. Which of the following is not attributable to Siderotic granules
  - a. These are hemoglobin iron granules
  - b. They appear dense blue in Romanowsky stains
  - c. The distribution in the red cell is uneven
  - d. They are also referred to as Pappenheimer bodies
  - e. The granules are regular and evenly distributed
17. The following disease conditions may present with basophilic stippling except?
  - a. Thalassemia
  - b. Megaloblastic anaemia
  - c. Heavy metal poisoning
  - d. Aplastic anaemia
  - e. Liver disease

18. The following are true of cabot rings except?
- They appear as thread-like inclusions
  - Mostly occur in severe anaemia
  - These are remnants of cytoplasmic organelles
  - Cabot rings are remnants of the nuclear membrane
  - May occur in dyserythropoietic conditions
19. Hypersegmented neutrophils contain the following
- At least 3 lobes
  - No lobes
  - Disintegrating lobes
  - More than 5 lobes
  - Less than 4 lobes
20. Pelger huet anomaly is associate which which of the following cells?
- Neutrophils
  - Lymphocytes
  - Monocytes
  - Eosinophils
  - Platelets
21. Auer rods occur in which of the following leukaemic blood cells
- Normal red cells
  - Leukemic red cells
  - Myeloblasts
  - Lymphocytes
  - Monoblasts
22. Iron circulates bound to the following molecules
- Hemosiderin
  - Ferritin
  - Transferrin
  - Siderocytes
  - Mucosal cells
23. Which of the following is the largest source of iron in the body?
- Bone marrow
  - Tissues
  - Liver
  - Red cells
  - Mucosal cells
24. A porphyrin ring is formed by the condensation of the following
- Four pyrrole rings
  - Two molecules of porphobilinogen
  - Four molecules of porphobilinogen
  - Four molecules of aminolevulinic acid
  - Four protoporphyrin rings

25. What is the function of ferrochelatase enzyme in heme synthesis
  - a. Chelate iron from protoporphyrin
  - b. Remove zinc from porphyrin
  - c. Add iron to the protoporphyrin
  - d. Add iron to the pyrrole ring
  - e. Chelate cobalt from beta carotene
26. One haemoglobin molecule contains the following
  - a. 2 globin + 4 heme groups
  - b. 4 globin + 4 heme groups
  - c. 4 globin + 2 heme groups
  - d. 2 globin + 2 heme groups
  - e. 1 globin + 4 heme groups
27. Total body iron is estimated to be about the following grams
  - a. 2gms
  - b. 4gms
  - c. 6gms
  - d. 8gms
  - e. 1gm
28. Types of spreader slides used for making peripheral smear include the following except
  - a. Polished slide
  - b. Ogee
  - c. Flat polished
  - d. Bevel
  - e. Frosted
29. The following is not a type of Romanowsky stains
  - a. Fields stain
  - b. Wrights
  - c. May-Grunwald
  - d. Leishman
  - e. Giemsa
30. The following radioisotope is not used in haematological studies
  - a. Cobalt-57
  - b. Chromium-51
  - c. Iron 59
  - d. Iodine-125
  - e. Carbon-12

**SECTION B**

**Question thirty one**

Discuss the following

- a. Light scatter as used in automated cell counts (10mks)
- b. Describe reactive changes in the following
  - i. Neutrophils 5mks
  - ii. Lymphocytes 5mks

**Question thirty two**

Compare and contrast polymorphonuclear cell granules (20mks)