

1412/312
HAEMATOLOGY AND IMMUNO-HAEMATOLOGY
June / July 2004
Time: 3 hours

THE KENYA NATIONAL EXAMINATIONS COUNCIL
MEDICAL LABORATORY TECHNOLOGY CRAFT

HAEMATOLOGY AND IMMUNO-HAEMATOLOGY

3 hours

INSTRUCTIONS TO CANDIDATES

You should have the following for this examination:

Answer booklet
Scientific calculator (battery operated)

This paper consists of **TWO** sections; **A** and **B**.
Answer **ALL** the questions in Section **A** and any **TWO** questions from section **B**.
Each question in section **A** carries 4 marks while each question in section **B** carries 20 marks.
Maximum marks for each part of a question are indicated.

SECTION A

Answer ALL the questions in this section.

1. Replace each of the following statements with a single word:
 - (a) The bursting of the red blood cells and the loss of haemoglobin. (1 mark)
 - (b) Amount of packed red cells expressed as a percentage of the total blood volume. (1 mark)
 - (c) A relative or absolute increase in the number of circulating red cells. (1 mark)
 - (d) The largest white blood cell, part of the macrophage defense system. (1 mark)

2. Describe the appearance of each of the following cells on a blood film stain with Field stain.
 - (a) red cells (1 mark)
 - (b) platelets (1 mark)
 - (c) lymphocytes (2 marks)

3. State ONE use of each of the following anticoagulants.
 - (a) Trisodium citrate (1 mark)
 - (b) Acid citric dextrose (ACD) (1 mark)
 - (c) Heparin (1 mark)
 - (d) EDTA (1 mark)

4. Describe how blood is obtained from a patient by capillary method. (4 marks)

5. Figure 1 and 2 below show the abnormalities in neutrophil morphology.

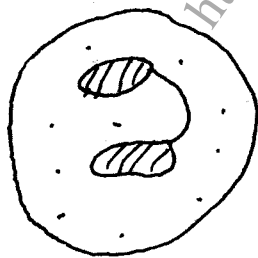


Figure 1

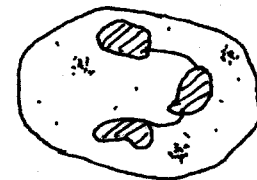


Figure 2

- (a) Identify each of the abnormalities. (2 marks)
- (b) Distinguish between natural and immune antibodies. (2 marks)

6. (a) Define the term adsorption. (1 mark)
- (b) Giving examples, describe lectins. (3 marks)
7. (a) Explain the clinical importance of the Rhesus blood group. (2 marks)
- (b) Name TWO other blood group systems with immune antibodies. (2 marks)
8. (a) Define the term haemoglobin. (1 mark)
- (b) Name TWO types of haemoglobin found in adults and indicate the composition of their polypeptide chains.
9. State:
- (a) TWO advantages of visual methods of haemoglobin estimation. (2 marks)
- (b) Where each of the following reagents is used in haemoglobin estimation. (2 marks)
- (i) 0.04% ammonium solution.
- (ii) Drabkins solution.
10. List FOUR factors required for blood to clot according to morawitz theory. (4 marks)
11. Describe the staining of a blood film (smear) using diluted Giemsa stain. (4 marks)
12. Give the significance of the following cells in the blood.
- (a) Macrocytes. (1 mark)
- (b) Microcytes (1 mark)
- (c) Siderocytes (1 mark)
- (d) Sickle cells (1 mark)
13. State FOUR functions of blood. (4 marks)
14. Describe the preparation of Wright's stain. (4 marks)
15. (a) Define erythrocyte sedimentation rate (ESR). (1 mark)
- (b) State the principle of Westergren method. (3 marks)

SECTION B

Answer any *TWO* questions from this section.

16. (a) A man homozygous for blood group A married a woman with blood group O. Work out the blood groups of their children (F_1 offsprings). (5 marks)
- (b) Describe the collection of blood from a donor using a glass bottle (phlebotomy). (15 marks)
17. (a) List FOUR diseases that may be transmitted through blood transfusion. (4 marks)
- (b) Explain why a blood donor may be rejected. (6 marks)
- (c) Describe the indirect coombs test. (10 marks)
18. (a) Using a flow diagram illustrate each of the following processes.
- (i) formation of red blood cells (erythropoiesis). (8 marks)
- (ii) formation of monocytes. (6 marks)
- (b) (i) In an experiment to estimate the number of white blood cell in one litre of blood, 188 cells were counted in the four squares of the haemocytometer. Calculate the number of white cells per litre. (3 marks)
- (ii) Describe the preparation of Turk's fluid. (3 marks)
19. (a) Describe
- (i) Duke's bleeding time method. (8 marks)
- (ii) Haemoglobin estimation by Sahli method. (12 marks)