

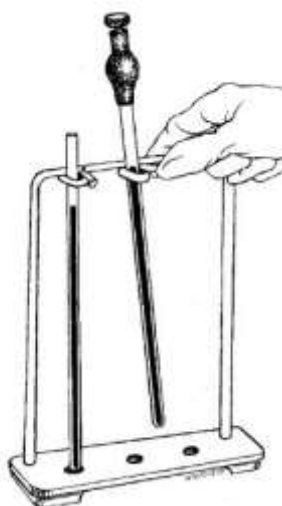
1. Q1/ Identify the Following materials? In which the hematology test each of them is used? (20Marks)



1



2



3



4

2. Q2/A/ what are the differences between plasma and serum and how you can prepare both of them practically? (15Marks)
3. B/The rate of ESR is increasing during inflammation? Explain the mechanism? (15Marks)

4. Q3/ Fill the blanks with suitable words? (30 Marks)

1. The processes of blood formation in the bone marrow is called, while the formation of RBC alone is called
2. For determinism the manual Hb concentration by Cyanmethemoglobin method the solution is used.
3. Beside platelet count, coulter counter can calculate other parameters of platelets including....., and

4. The normal range of ESR and RBC count in females is equal to.....and respectively
5. About of population don not have RH antigen on their RBCs they are called
6. Turk's solution is consisting ofwhich lysing the RBCs and which enhance visualizing WBCs
7. 0.1N HCL solution is used for determining the..... level by method
8. During ESR test, (1.6 ml) of blood sample is mixed with (0.4 ml)in ratio 1:4
5. Q4/ Chose true and false for the following sentences, and correct the false without changing underline information? (20 Marks)

1. The normal range of PCV in men is located 40-50 g/dl
2. All types of anemia will causing increasing ESR level except Sickle cell anemia causes reducing ESR
3. If we count the WBCs in two large squares on Neubauer hemocytometer, then the volume in counted squares is equal to 0.2 mm^3
4. Ringer's solution is used during manual RBC counting
5. Secondary thrombocytopenia is mean decreasing in the number of platelets during physiological conditions

6. Q1/ Write briefly the aim of using the followings in hematological tests

1. Trisodium citrate in ESR
2. Turk's solution
3. Pottassium ferricyanide in Hb determination

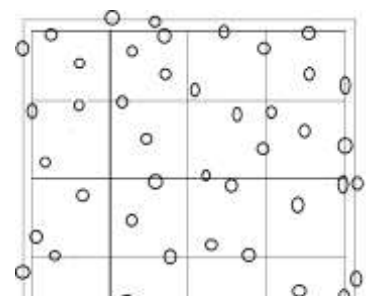


Q2

a. A/ Write the name of this tube and mention the errors during this sample collection for estimation Htc

B/What are the suspected layers which are formed after centrifugation of this tube.

Count WBCs in this large square and calculate the



number of WBC in 1 μl of blood (if you know the sample is 10 times diluted) and explain the result?

Q4/ Explain why

7. The RBC pipette in some cases is used for WBC count instead of WBC pipette?
8. The error encountered in Hb estimation by SAHLI method may be up to 15 %? Mention two of sources error

Q5/

1. What are the differences between plasma and serum and how you can get both of them practically?
2. During blood sugar estimation blood collected in Oxalate or EDTA tubes mixed with sodium fluoride. Why?

Q6/

9. Why you are performing ESR? Write the principle of the test?
1- What are the stages of ESR?

Q7/

- a. How many platelet parameters are measured by coulter counter? What is the importance of the solution in manual PLT counting?

Q8

- b. A/ Identify this test and briefly write the principle of it

B/ It's not true to divide PCV value by 3 for obtaining hemoglobin concentration in patients ? Why

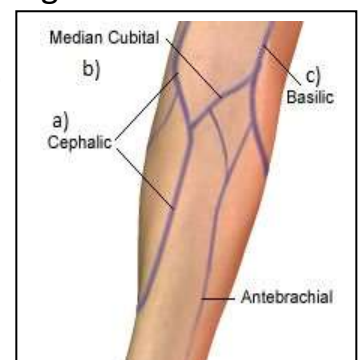


Q9 A/ True or false

1. Polycythemia Vera is overproduction of RBC which is resulted from hypoxia?
2. Hayme's solution is used for diluting the blood during RBC counting

10. Q9 A/ Chose the correct answer

1. Which of the following vein is the first choice of vein puncture?
A) Cephalic vein B) Median cubital vein C) Basilic vein

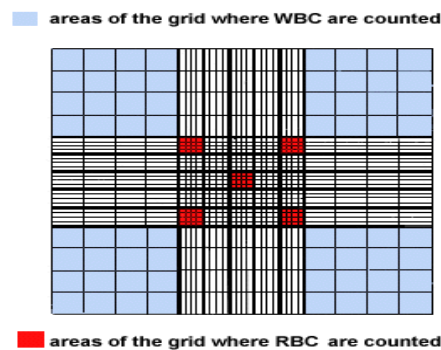


2-is an anticoagulant which prevent blood clotting by inhibiting thrombin activity

- a) Heparin, b) Sodium citrate, c) Salt-EDTA

Q10/

a. If the number of RBCs in 3 medium squares of hemomacutometer slide was 288 cell, calculate the number of RCB in 1 liter of blood?



11. Q1 / Reticulocytes have dark-blue clusters filaments when they are stained with new methylene blue. Explain? (15 Marks)

12. Q2 / Fill the following blanks with suitable words? (15Marks)

- 1- Normal range of platelets in human is
- 2- Drapkin's solution is used for measuring.....
- 3- solution is used for manual RBCs counting.

13. Q3 / In which hematological tests the following materials are used? write the aim of their use? Answer only two? (10 marks)

- 1- (Turk's) solution
- 2- 95% ethyl or methyl alcohol
- 3- Anti B antibody

14. Q4/ Chose the correct answer for the following sentences? (10 marks)

- 1- Serum is plasma with out
 - a) Anticoagulants
 - b) Clotting factors
 - c) Coagulants
 - d) Antibodies

2- One of the following materials is not used in Hct measurement

- a) Hematocrit microcentrifuge b) Non-heparinized capillary tube
c) 0.1 N HCl d) Adam's reader

15. Q5/ write the purpose of doing the following tests?

- 1- Hematocrit or packed cell volume (PCV)
- 2- Erythrocyte sedimentation rate (ESR)
- 3- Clotting time

(30 marks)

16. Q6/ Chose True or false for the following sentences and correct the false sentences
(No correction you will get half mark? (20 Marks)

- 1- An increase in the number of circulating platelets is called thrombocytopenia.
- 2- Vitamin K deficiency is one of the factors that Prolong bleeding times.
- 3- Red blood cells commonly live 140 days in circulation.
- 4- Heparin prevents transformation of prothrombin to thrombin.
- 5- Polycythemia it means decrease number WBC in blood.

17. Q1 /A/ Fill the following blanks with suitable words (10 Marks)

- 1- MCHC is means:
- 2- CBC is abbreviation of test
- 3- The normal range of platelets in adult is
- 4-**Is a genetic disease that is related with increased the cleating time result**
- 5- test specifically evaluates the presence of factors VII, V, and X, prothrombin, and fibrinogen

18. Q2 / Answer two of the followings. (10 Marks)

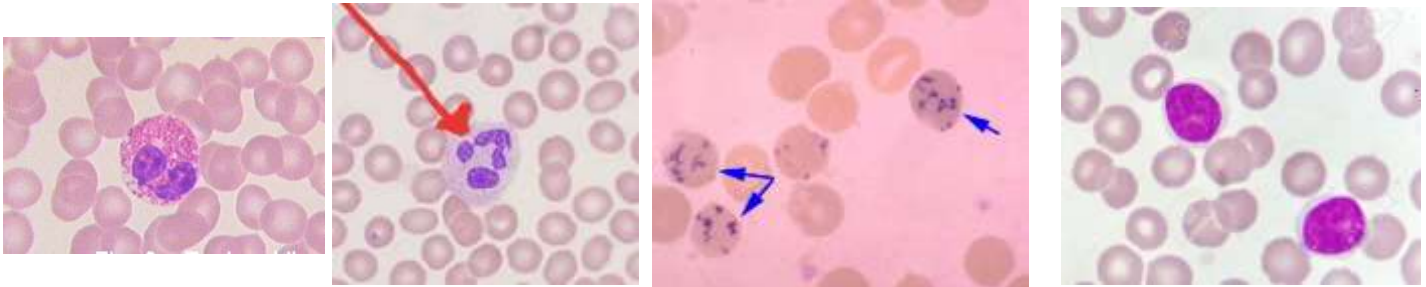
- 1- Write the application of Reticulocyte count test in hematology
- 2- Fixation of blood smear by immersing the slide in 95% ethyl or methyl alcohol is required before staining with Giemsa stain? Why?
- 3- Write the main functions of cross matching test:

19. Q3/ Chose True or false signs for the following sentences and correct the false sentences without changing underlined information (No correction you will get half mark? (10 marks)

- 3- Thrombocythemia is mean decrease in the number of platelets

- 4- Normocytic/normochromic anemia caused by iron deficiency, lead poisoning
- 5- During major cross match test the serum of donor is mixed with RBC of recipient
- 6- With increasing the tilting of Westegren's tube the rate of ESR is increasing
- 7- RDW is parameter that measures the average volume of a red blood cell

20. Q4/ Identify the following types of cell and their normal ranges



A	B	C	D
-			
-			

- 6- Measuring of the relative percentage of blood cells (mainly erythrocytes) in a given volume of whole blood is calledtest
- 7- CBC is abbreviation of test
- 8- The normal range of WBC in adult is
- 9- About of population do not have RH antigen on their RBCs
- 10- The test measures the time it takes to form a primary hemostatic plug to arrest hemorrhage is called

22. Q2 / Answer two of the followings (10 Marks)

- 4- Platelets are difficult to count?
- 5- Fixation of blood smear by immersing the slide in 95% ethyl or methyl alcohol is required before staining with Giemsa stain? Why?
- 6- Write the principle of increasing ESR result during inflammation?

23. Q3/ Chose True or false for the following sentences and correct the false sentences (No correction you will get half mark?) (10 marks)

- 8- Normally the size of thrombocyte is ranging from 2-4 microns
- 9- The normal range of reticulocyte in Newborns: 0.5 – 8 %
- 10- Hayme's solution is used for diluting the blood during RBC counting

- 11- Thrombocytopenia it is mean increase in number of Neutrophils
12- For measuring Hb by sahli's method , drabkin's solution is used

24. Q4/Using methylene blue stain in reticulocyte counting procedures? Explain?
(10 marks)

25. Q5/Write the mechanism by which heparin prevents blood clotting.
(10 marks)

26. Q6/Chose the correct answer: (10 marks)

A/ The largest cells in the blood that leave the bloodstream to become macrophages are the

1/ Eosinophils 2/monocytes 3/basophils 4/neutrophils

B/ Which vitamin when deficient will cause plolonged coagulation?

1/ Vitamin C 2/ vitamin B12 3/vitamin A 4/ vitamin K

C/ If you have some blood from which the formed elements have been removed, how can you tell if it is plasma or serum? If

1/plasma contains haemoglobin: serum does not.

2/ serum is yellow: plasma has no colour.

3/serum contains antibodies: plasma does not.

4/plasma contains clotting protein: serum does not.

D/ Which of the following is not associate with decreased ESR?

1/ spherocytosis 2/ hypogammaglobulinemia 3/ cold agglutinins 4/ polycythemia

27. Q1 /A/ Fill the following blanks with suitable words? (30 Marks)

1- The normal platelets count is between

- 2- Heparin is anticoagulant that act as
- 3-is the time required for the generation of thrombin, while the time required to form a primary hemostatic plug is called.....
- 4- Drabkin's solution is used from measuringlevel by Method
- 5- Excess production of RBC due to abnormalities in the bone marrow is called
- 6- Folate deficiency, or vitamin B-12 deficiency cause a type of anemia which is characterized by high MCV and normal MCH red blood cells; calledanemia
- 7- Variation in RBC sizes is called which is measured by a special CBC parameter which is called

28. Q2 / Answer two of the followings questions (20 Marks)

- 7- Sahli's method for measuring Hb level is not accurate method; error encountered may be up to 15%? Explain?
- 8- Minor Crossmatch is less important comparing to Major Crossmatch? Under few urgent cases blood transfusion allowed even if minor crossmatch result is incompatible. Explain ?
- 9- What is reticulocyte? Why it is appeared different from RBC when the blood smear is stained with new methylene blue? Explain?

29. Q3/ Chose True or false for the following sentences and correct the false sentences without changing the underlined information? 30 marks

- 1- The normal range of WBC in females is ranged between 4,500-11,500 WBCs per mm³
- 2- For making blood smear the angle of spreader slide should be decreased if a patient has a low RBC count.
- 3- The rate of ESR will not change, if ESR tube is tilted
- 4- Turks solution is used for lysing RBC during Manual platelet counting
- 5- Normocytic /normochromic anemia is caused by iron deficiency, lead poisoning, or thalassemia.

30. Q/Chose the correct answer for the following sentences?

20 Marks

- 1- In one of the following condition the level of Hb is decreased
 - a) Kidney diseases
 - b) Congenital heart failure
 - c) lung diseases
 - d) Adaptation to high altitude
- 2- In one of the following condition the rate of ESR is reduced
 - a) Anemia
 - b) polycythemia
 - c) Pregnancy
 - d) Acute and chronic inflammation
- 3- If we count the RBC in all 25 medium sized squares on Neubauer hemocytometer, then the volume of counted squares is equal to
 - a) 0.01 mm^3
 - b) 0.02 mm^3
 - c) 0.1 mm^3
 - d) 0.2 mm^3
- 4- In normal person the most abounding type of WBC cells found in the blood film is
 - a) Monocyte
 - b) lymphocyte
 - c) Basophil
 - d) neutrophil
- 5- Serum is plasma with out
 - a) Anticoagulants
 - b) Clotting factors
 - c) Coagulants
 - d) Antibodies

31. Q1 / Fill the following blanks with suitable words

(20Marks)

- 11- Measuring of the relative percentage of blood cells (mainly erythrocytes) in a given volume of whole blood is calledtest
- 12- For determinism the manual Hb concentration by cyanmethhemoglobin method the solution is used.
- 13- Normal range of platelets in human is
- 14- During making blood smear the angle of the spreader slide should be....., if the patient has low hematocrit value
- 15- Variation in RBC sizes is called which is measured by a special CBC parameter which is called

16- Increased number of RBC is called..... while decreasing number of platelets is called.....

17- Estimation of hemoglobin by method is not accurate

18- The normal range of WBC in adult is

32. Q2/In which hematological tests the following materials are used? write the aim of their use?

Answer two of them

(20 Marks)

- 1) New Methylene Blue
- 2) Turk solution
- 3) Ringer's solution

33. Q3 / Answer two of the followings

(20 Marks)

10- Write the purpose of cross match test

11- Fixation of blood smear by immersing the slide in 95% ethyl or methyl alcohol is required before staining with Giemsa stain

12- Write the principle of increasing ESR result during inflammation?

34. Q4/ Chose True or false for the following sentences and correct the false ones without changing underline information (No correction you will get half mark? (20 Marks)

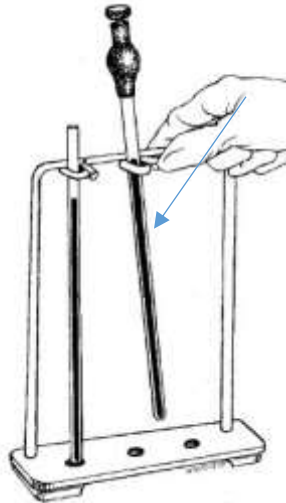
- 1- Bleeding time is the time required to form primary haemostatic plug while clotting time is the time required to form fibrin threads
- 2- The normal range of RBC in female is located between (5000-11000/ μ l)
- 3- Normally size of thrombocyte is ranging from 2-4 microns
- 4- Willebrand's disease is characterized by decreasing number of platelets
- 5- Normal range of M.C.H.C is located between 32 – 36 pg

35. Q5/ Identify the following images, For A and B write the name of the test in which these two instruments are used, for C and D write the normal range of each pointed cell type in blood? (20 Marks)

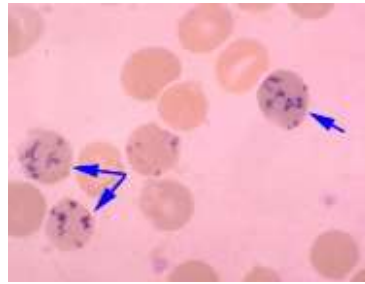




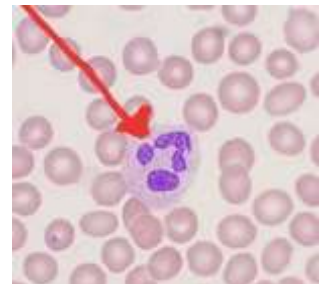
A



B



C



D

36. Q1 /A/ Fill the following blanks with suitable words. (30 Marks)

1. The hematology test that is used to evaluate the integrity of extrinsic and common pathway is called
2. is a parameter that measures variation in red blood cell size or variation of red blood cell volume which is called.....
3. The least common type of blood group in ABO system is
4. The ESR and tests are used to detect inflammations associated with conditions such as infections, cancers, and autoimmune diseases.
5. Estimation of Hemoglobin by method is not accurate
6. The normal range of Lymphocytes in male is
7. Microcytic/hypochromic anemia is caused by,, or [89t\\Carboxyhaemoglobin is formed when haemoglobin binds to

37. Q2/ Chose the correct answer for the following sentences. (36 Marks)

1. Only for one of the following situation the rate of ESR is not raised.
 - a) Dehydration
 - b) Anemia
 - c) Tuberculosis
 - d) Arthritis

2. 150,000 to 400,000/ μl is the normal range of
 - a) Erythrocytes in male
 - b) Thrombocytes
 - c) Neutrophile
 - d) Leukocytes
3. A hematology parameter that measure of the relative percentage of blood cells (mainly erythrocytes) in a given volume of whole blood.
 - a) Major cross match
 - b) RBC count
 - c) Hb
 - d) PCV
4. The stain that used to stain the reticulocytes is called.
 - a) New methylene blue
 - b) Leishman Staining
 - c) Giemsa stain
 - d) Wright's stain
5. One of the following requirements is not used to measure Hb by cyanmethemoglobin method.
 - a) 0.1N HCl
 - b) Spectrophotometer
 - c) Standard solution
 - d) Drakpin's solution
6. If we count the RBC in 10 medium sized squares on Neubauer hemocytometer, then the volume of counted squares is equal to
 - a) 0.01 mm^3
 - b) 0.02 mm^3
 - c) 0.04 mm^3
 - d) 0.8 mm^3
7. Serum is plasma with out
 - a) Anticoagulants
 - b) Coagulants
 - c) Clotting factors
 - d) Antibodies
8. The normal ranges of MCHC is equal to
 - a) 32–36 %
 - b) 27 – 32 picograms
 - c) $13 \pm 1.5\%$
 - d) 80-100 (femtoliters)
9. One of the following solutions is used to measure the total white blood cell count.
 - a) Ringer solution
 - b) Ammonium oxalate
 - c) Hayme's solution
 - d) Turk's solution

38. Q3/ Write the aims (purposes) of reticulocyte counting. (18 marks)

39. Q4/ Answer one the following questions? (16 marks)

A. Minor Crossmatch is less important comparing to major cross match, Explain?

B. ESR level is raised in patients with inflammation comparing to normal people. Explain?

40. Q1 /A/ Fill the following blanks with suitable words

19- measuring of the relative percentage of blood cells (mainly erythrocytes) in a given volume of whole blood is calledtest

20- **CBC is abbreviation of test**

21- **The normal range of WBC in adult is**

- 22- **About of population don not have RH antigen on their RBCs they are called**
- 23- During making blood smear the angle of the spreader slide should be....., if the patient has low hematocrit value
- 24- The test measures the time it takes to form a primary hemostatic plug to arrest hemorrhage is called
- 25- Increased number of RBC in called..... While decreasing number of platelets is called.....

41. Q2/In which hematological tests the following materials are used? wriight the aim of their use? Answer two of them

4) **Drapkins solution**

5) **Turk solution**

6) 0.1N solution of HCl

42. Q3 / Answer the followings

13-**Platelets are difficult to count**

14-Fixation of blood smear by immersing the slide in 95% ethyl or methyl alcohol is required before staining with **Giemsa stain**

15-**Hemoglobin** Gives better indication of the oxygen carrying capacity of the blood than RBC counts?

43. Q4/ Write the principle of increasing ESR result during inflammation?

44. Q5/ Chose True or false for the following sentences and correct the false ones without changing underline information (No correction you will get half mark?)

13-Normal range of MCV is located between 32 – 36 pg

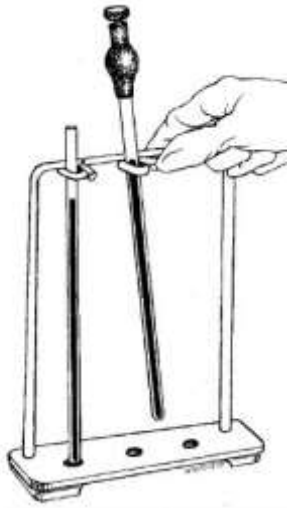
14- Normally size of thrombocyte is ranging from 2-4 microns

15- Normocytic/normochromic (NC/NC) anemia is caused by iron deficiency

16- The normal range of reticulocyte in Newborns: 0.5 – 8 %

17- RDW is the parameter that measure hemoglobin content of RBC

45. Identify this equipment and mention in the name of blood test we can do by each of them



20 Marks

count, Lymphocyte, Hb, **PTT**, Absorbancy at 540 nm, Acidophil, Iron deficiency anemia, non-of them)

46. Q3 Choose true or false, and correct the false sentences (no correction there is no mark)

- 6- Bleeding time is the time required to form primary haemostatic plug while clotting time is the time required to form fibrin threads
- 7- In light scatter culter counter high angle forword light scatter detemine the cell granularity
- 8- For making blood smear for patients with high hematocrit, the angle of the spreader slide should be increased
- 9- The normal range of Reticulocyte in s Newborns: 0.5 – 1.5 %
- 10-Normally size of thrombocyte is ranging from 2-4 microns
- 11-Willebrand's disease is characterized by decreasing number of platelets
- 12-Normal range of M.C.H.C is located between 32 – 36 pg
- 13-Only for patients you can convert Hct value to Hb.
- 14-Kidney diseases has direct effect on the production of WBC
- 15- ESR test, indirectly measures how much inflammation is in the body.

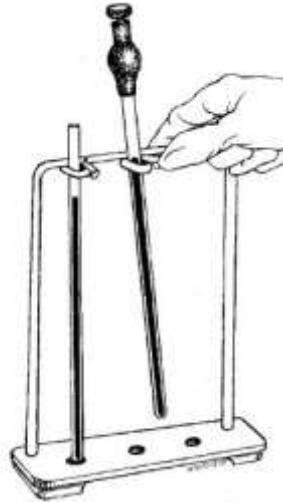
Q5/

20 Marks

47. A/ Find the number of RBC if you know the number of RBC counted in 4 medium squares are equal to 170, 180, and 160 and 190, and decide about the case depend on the number of RBC cells 12 Marks

48. B/ Write the name of the following material and write the name of testes which are used for?

8 Marks



1

2

3

4

49. Q1 / Fill the blanks with suitable words (answer 4) (32 Marks)

- 1- The least common type of WBC is called..... characterized by granules
- 2- Drabkin's solution is used from measuring level by Method
- 3- There are two tests for detection non-specific inflammation including and
- 4- MCH it meansand its normal range is
- 5- Variation In the size of RBC is called , While variation in shape is called.....

50. Q2 /A/ In which hematological tests the following materials are used? Write the aim of their use?

Answer only two?

(18 marks)

- 4- Ringer solution

- 5- 0.1 N HCL
- 6- Absolute methanol

51. Q3/ Answer two of the following?

(26 Marks)

- 1- What are the differences between serum and plasma? How you can prepare each of them in the lab?
- 2- Hb estimation by Sahli's method is not accurate?
- 3- The rate of ESR in patients with inflammation is higher compares to normal person

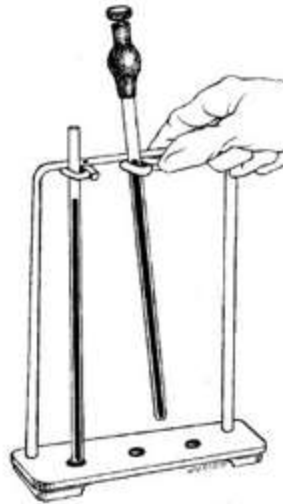
52. Q1/ Identify the Following materials? In which the hematology test each of them is used?



1



2



3



4

53. Q1 / Fill the blanks with suitable words

(20 Marks)

1. ESR abbreviation is mean
2. RBCs are made in the bone marrow by the "erythroid" precursor cells; they are stimulated by lack of and by the kidney hormone
3. Heparin is anthat inhibit blood clotting by preventing
4. The accurate method of Hb measurement is called.....
5. The normal range of PCV in female
6. Hb normal range in WBC in male.....
7. Increase in the number of RBC as a result of abnormality of bone marrow is called
8. Serum is plasma without

54. Q2 / In which hematological test, each of the following material is used? Write the aim of their use?

(20 marks)

- 7- Heparinized capillary tube
- 8- 0.1 N HCL
- 9- 0.8 Sodium citrate
- 10- Ringer solution

11- Turks solution

55. Q3 / Find the number of RBC of a patient if the counted cells in 25 squares of hemocytometer is 2600 and the dilution of blood is 1/100. Evaluate the result. (10 Marks)

56. Q4/Answer the following questions by choosing either Increased, decreased or Unchanged

(10 Marks)

1. ESR in patinas with sickle cell anemia
2. PCV in dehydrated patient
3. RBC count in patients with chronic lung disease
4. HB during malnutrition of vitamin D3
5. ESR in during tilting of the Westergren tube

57. Q1/Match the words in the column (B) to the sentences in the column(A). write the correct answers next to the sentences. (30 Marks)

1. The formation of blood cells in the bone marrow
2. RDW measure the variation of RBC size
3. Anemia is caused by sudden blood loss, [sepsis](#), tumor or long-term disease
4. Rate of conversion of Hb to acid-hematin varies with time and temperature.
5. 11×10^6 RBC/ μ l
6. Measure the relative percentage of blood cells (mainly erythrocytes) in a given volume of whole blood
7. The blood is diluted with Turkey's (Turk's) solution which consists of 2 ml glacial acetic acid, 1 ml of crystal violet (1%) and 97 ml D.W
8. low MCV and normal RDW.
9. The amount of hemoglobin relative to the size of the cell
10. Anemia results from chemotherapy, folate deficiency, or [vitamin B-12 deficiency](#)

- a. Sahli's method
- b. Hematocrit
- c. WBC count
- d. MCHC
- e. Hb
- f. Macrocytic/normochromic RBCs
- g. Hematopoiesis
- h. Cyanmethemoglobin
- i. Microcytic/normochromic RBCs
- j. Erythropoiesis
- k. Anisocytosis
- l. RBC count
- m. Normocytic/normochromic RBCs
- n. sickle cell anemia
- o. MCH
- p. Thalassemia
- q. Erythrocytosis

58. Q2/Chose true and false signs for the following questions and correct the false questions without changing underlined information? (NO correction half mark will be given).

28 marks

1. Thrombocytopenia is mean in mean a decrease in number of white blood cells
2. The ESR is inversely proportional to plasma viscosity
3. K₂EDTA anticoagulant works by prevents the transformation of prothrombin to thrombin
4. Methemoglobin is form when carbon monoxide reacts with hemoglobin
5. Iron deficiency anemia is the most common kind of anemia.
6. Immediately after birth in people with B blood type, agglutinins against antigen A in the plasma available
7. The normal range of MCV is equal to 14- 18 gm/dl in males

59. Q3/ Identify the Following materials? In which the hematology test each of them is used?

(20Marks)



1



2



3



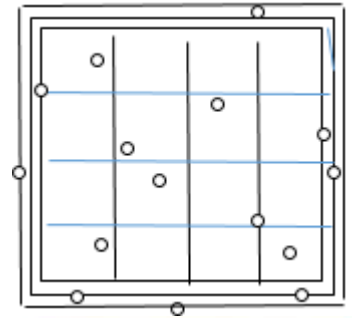
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60. Q1 / Answer the following questions.

(22 Marks)

61. Write the mechanism of increasing the rate of ESR in patients with inflammation.

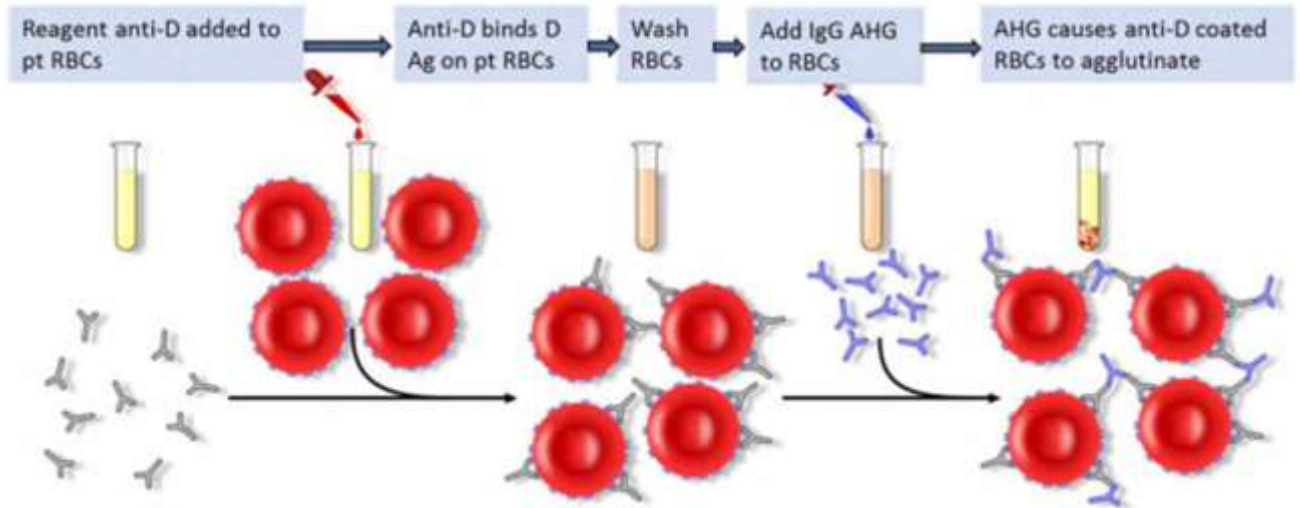
62. Count the number of platelet according to this squar if you know that the plattlets are homogenously distributed over the 25 squar of hemocytometer. evaluate the results



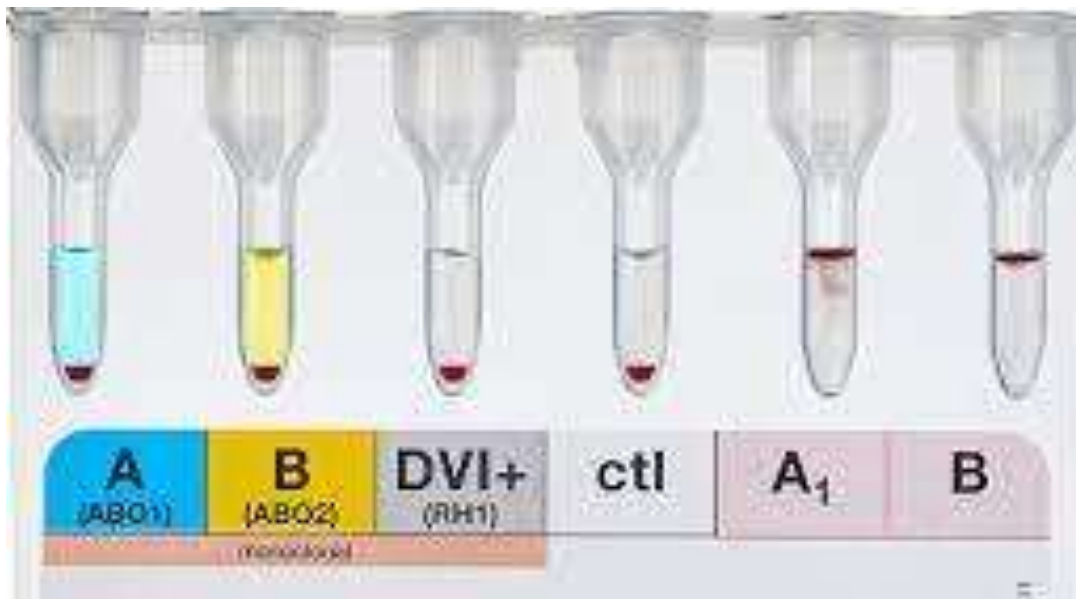
63. Write the role of bovine albumin in cross match test ?

64. Write the purpose of check cells in cross match tests ?

65. Write the name of this test, what is the purpose of this test?



66 Write the name of these sample 2- Determine the type of the blood group in this sample



67 Identify this sample ,Write the name of blood components which can be separate from it

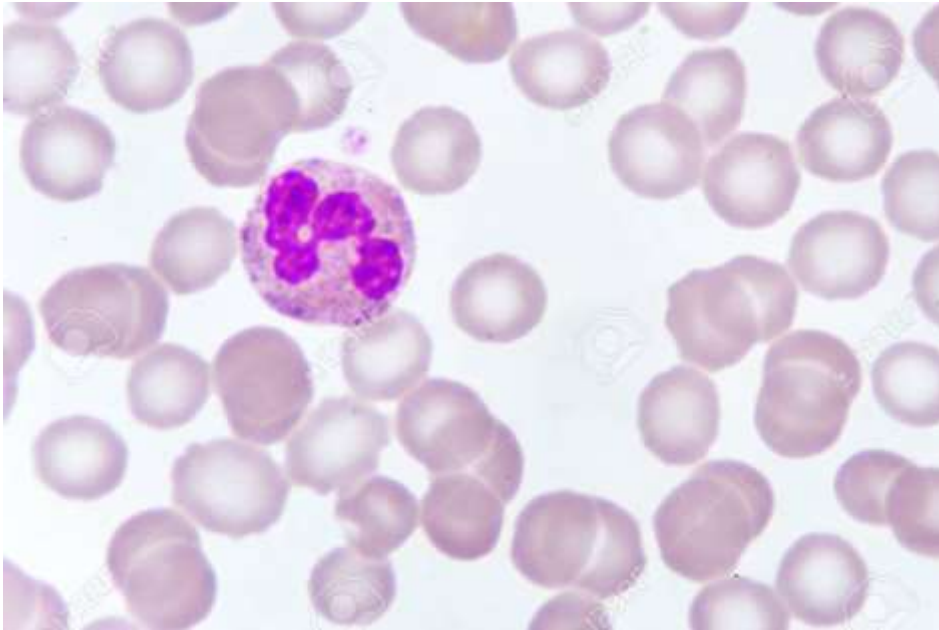


1.

68- Write the name of these instrument. Write the importance of its use .



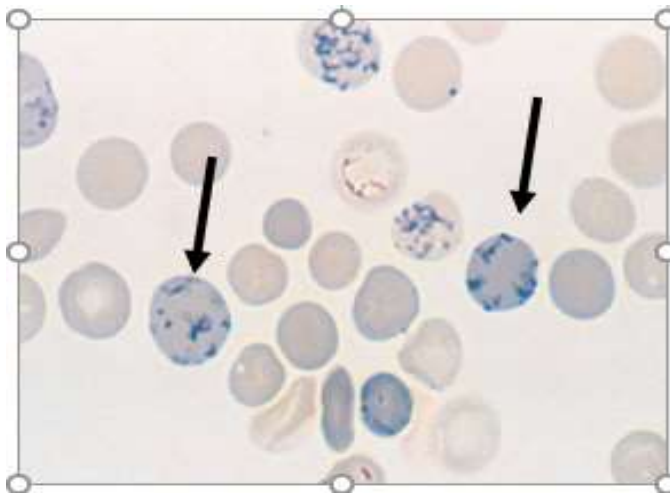
69-Identify the cell marked with an arrow . Increase in the number of this cell is called While decrease in number is called



70-Identify the cell marked with an arrow.

71-What will happen to the number of these cells in the following condition (choose Increased, decreased or unchanged)

- A. IDA
- B. Hemorrhage
- C. G6PD Deficiency



72-Write the condition and duration (for how long they can be stored) of storage of the following blood components

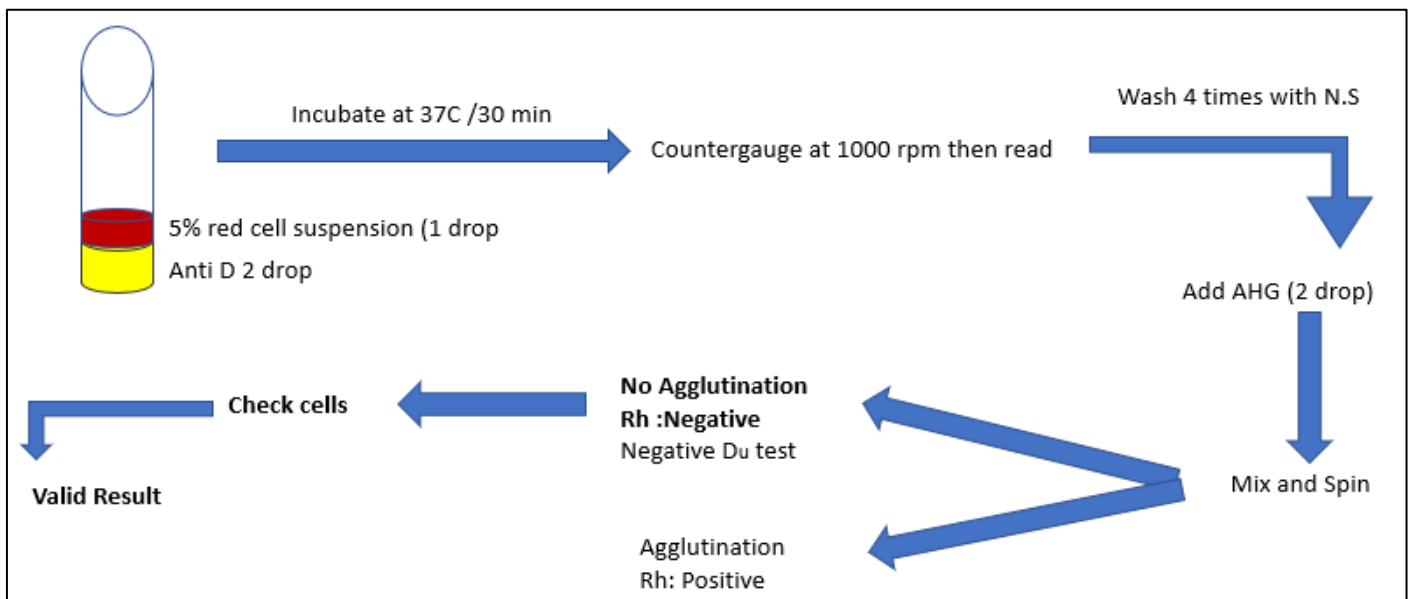
1. Packed RBC
2. Cryoprecipitate
3. Platelet

73.-Write the types of anemia depend on the causes(etiology)

74..Write the name of stain which is used for reticulocyte counting

75..Write the purpose of cross match test .In short cross match serum from recipient is mixed with RBC of donor. True or false ?

76..Write the name of this test, what is the purpose of this test



77..Identify the name of these sample . Write purpose of using SAG-M

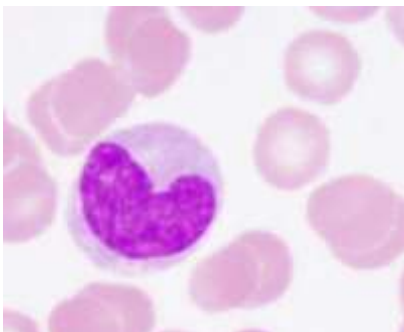


79..Write the name of this symptom . Write the name of anticoagulant in blood unit

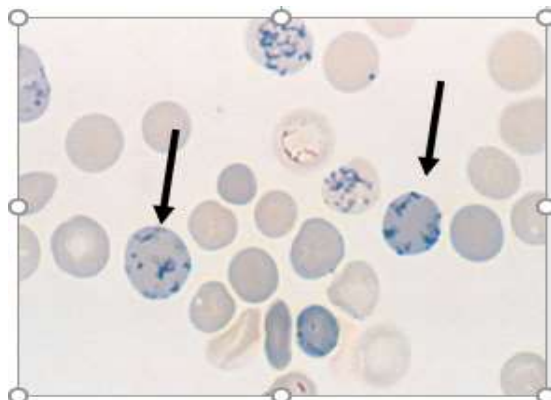


1.

80..Identify the cell marked with an arrow. Increase in the number of this cell is called While decrease in number is called



81..Identify the cells marked with an arrows. Write the purpose of counting this type of cells



82..Determine this ABO blood type

83..Why are Reticulocytes appeared as cells with dark-blue clusters and filaments when they are stained with new methylene blue ?

Patient RBCs	Patient RBCs	Patient Plasma	Patient Plasma
Anti-A Antibody	Anti-B Antibody	Type A RBCs	Type B RBCs

Good Luck

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