Complete blood count (CBC) –Practical-2:

It includes:

1-Red blood cell count / µl of blood **2-** White blood cell count µl of blood. / µl of blood. **3-**packed cell volume or microhaematocrit value (PCV% or HCT %) **4-** Haemoglobin concentration in gram/ deciliter (g/dl) of blood. **5-**Erythrocyte indices: MCV (fl), MCH (pg) & MCHC (g/dl). **6-** Differential leukocyte count. **7-** Plateletes count**.** **8-** Others.

Anemia is defined as a decrease in the hematocrit, erythrocyte count, and hemoglobin concentration. **Relative anemia** is not associated with a true reduction in the total red blood cell (RBC) mass, but rather is caused by a dilutional effect that can be observed after aggressive fluid therapy or other cause of increased plasma volume. **Absolute anemia** is considered an actual reduction in the total RBC mass.

Polycythemia is defined as an increase in the hematocrit, erythrocyte count, and hemoglobin concentration**. In relative polycythemia**, total erythrocyte mass is normal but appears to increase. **In absolute polycythemia**, increased erythrocyte production results in a true expansion of the total erythrocyte mass.

1- RBC count:

Indications: For the diagnosis of anaemia and polycythemia.
Materials:

*Fresh well- mixed blood sample.

*Diluting fluid (Hayem's solution).

* RBC diluting pipette.

*Haemocytometer.

*Coverslip

*Microscope.

Method:

* Pipette well-mixed blood to the mark o.5 as shown in the diagram.

* Wipe excess blood from outside of the pipette.

* Draw diluting fluid to the mark 101.

* Close tip of the pipette with your thump and rubber tube end with the index, mix thoroughly in figure eight for two minutes.

* Dilution will be 1:200.

* Clean the counting chamber, dry it and apply clean cover slide over the central area, apply gentle pressure on it.

* Blow out from the pipette one third of its contents to remove diluting fluid from the pipette stem.

* Holding the pipette in an angle of $^{o}45$ to the vertical, touch tip of the pipette on the area between the cover & central area of the haemocytometer.

* A drop of diluted blood will escape and cover the graduated area. Avoid air bubble formation or escape of fluid to surrounding grooves.

*Place the haemocytometer on the microscope stage leave it for i-2 minutes to allow cell setting.

*Under the high power (X 40) count number of rbcs in 5 squares (A, B, C, D, E) each of which is surrounded by triple lines and contain 16 smaller squares (reduce intensity of illumination).

Calculations: Dilution factor = 1/200, depth 1/1o, volume x5.

No. of RBCS /µl of blood = No of cells /5 small squares x 200 x10 x 5

(10000 - fixed factor).

=No of cells /5 small squares x10000.

Table (1) :Normal RBC count in different animal species

Animal sp.	RBCs $\times 10^6$ /µl
cow	5-10
Horse	6.5-12.5
Dog	5.5-8.5
Sheep	9-15
Goat	9-15

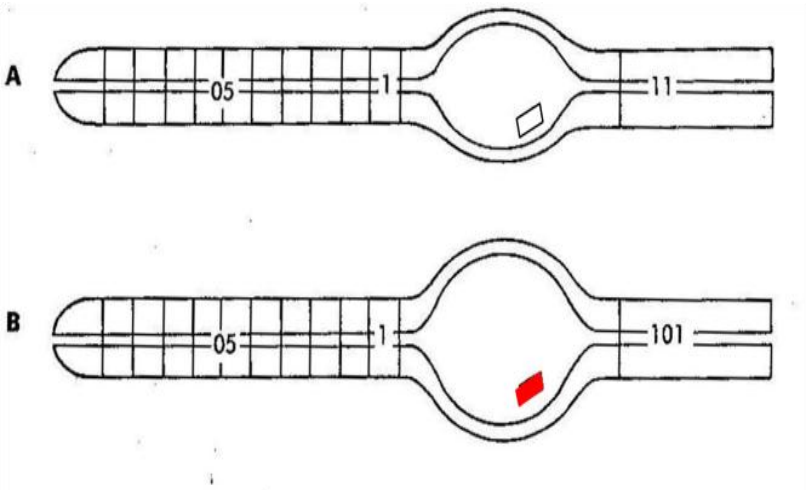

Fig. 3-1. Blood dilution pipettes. A, Capable of dilutions of 1:10 and 1:20, commonly used for leukocyte dilutions; B, capable of dilutions of 1:100 and 1:200, commonly used for erythrocyte dilutions.

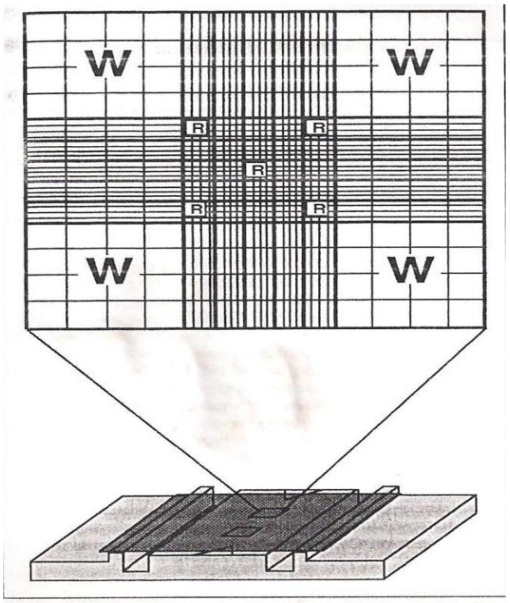

Figure 6-2 Neubauer hemacytometer. The large *Ws* indicate the squares that are counted for a total white blood cell (WBC) count with the 1:20 dilution WBC Unopette system. The small *Rs* indicate the squares that are counted for a red blood cell (RBC) count with the RBC Unopette system.