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**Q:1** Discus developmental stages of erythropoiesis.

**ANS:-**

**Stages of Erythropoiesis.**

The following stages of development all occur within the bone marrow:

- ❖ A hemocytoblast, a multipotent hematopoietic stem cell, becomes
  - ❖ A common myeloid progenitor or a multipotent stem cell, and then
  - ❖ A unipotent stem cell, then
  - ❖ A pronormoblast, also commonly called an proerythroblast or a rubriblast.
  - ❖ This becomes a basophilic or early normoblast, also commonly called an erythroblast,
  - ❖ A polychromatophilic or intermediate normoblast, then
  - ❖ An orthochromatic or late normoblast. At this stage the nucleus is expelled before the cell becomes
  - ❖ A reticulocyte.
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**Q:2** Enlist common causes of poor blood film(blood smear).

**ANS :-**

A blood film or peripheral blood smear is a thin layer of blood smeared on a microscope slide and then stained in such a way to allow the various blood cells to be examined microscopically.

- Blood films are usually examined to investigate hematological problems (disorders of the blood) and, occasionally, to look for parasites within the blood such as malaria and filaria.
- Examination of thin blood films is important in the investigation.

**The peripheral blood film (PBF) is of two types:**

1. Thin blood film
2. Thick blood film

**Three basic steps to make blood film:**

1. Preparation of blood smear.
2. Fixation of blood smear.
3. Staining of blood smear.

**CAUSES:-**

- Place a drop of blood in the centre of a clean glass slide 1 to 2 cm from one end.
  - Place another slide (spreader) with smooth edge at an angle of 30-45° near the drop of blood.
  - Move the spreader backward so that it makes contact with drop of blood.
  - Then move the spreader forward rapidly over the slide.
  - A thin peripheral blood film is thus prepared
  - Dry it and stain it.
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**Q:3.** Briefly explain Granulopoiesis in detail.

**ANS:-**

**Granulopoiesis:-**

Granulopoiesis is the process by which committed hematopoietic progenitor cells develop into granulocytes under the influence of various growth factors and cytokines

**FORMATION OF NEUTROPHILLS**

- ❖ Myeloblast. An early precursor cell, diameter 15-20um, lower nuclear cytoplasmic ratio, no cytoplasmic granules.
- ❖ Large cell with a large nucleus and which demonstrates basophilic staining. This stage exists for all granulocytes.

### **Promyelocytes**

- ❖ Is the next stage of maturation, similar in size and appearance to Myeloblast.
- ❖ During this stage primary (azurophilic) granules are formed. This stage exists for all granulocytes
- ❖ Has numerous azurophilic primary granules in cytoplasm, that contain variety of enzymes.
- ❖ Like myeloperoxidase, acid phosphates, beta galactosidase, 5-nucleotidase.

### **Myelocyte**

- ❖ Secondary granules become apparent.
- ❖ Increased size and smaller primary granules.
- ❖ Secondary granules have several bactericidal enzymes
- ❖ Nucleus become indented,

### **Metamyelocytes**

- ❖ Next stage in myelopoiesis is a cell having more indented and smaller nucleus and having more granule

### **Mature neutrophils**

- ❖ Arise from stem cells in approx 10 days. remain viable in systemic circulation for 8-12 hrs.

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**Q:4** What Is iron deficiency Anemia? Also discuss its causes

## **ANS:-**

Iron deficiency anemia is the most common type of anemia, and it occurs when your body doesn't have enough of the mineral iron. Your body needs iron to make hemoglobin.

When there isn't enough iron in your blood stream, the rest of your body can't get the amount of oxygen it needs.

Anemia is defined as a hemoglobin below the 5<sup>th</sup> percentile of healthy population.

Most studies showed this cutoff point to be around 11 g/dl (-2SD below the mean

## **Causes**

- ❖ Blood loss.
- ❖ A lack of iron in your diet
- ❖ An inability to absorb iron.
  
- ❖ Pregnancy.
  
- ❖ Uterine
  
- ❖ Gastrointestinal, e.g. peptic ulcer, oesophageal varices, aspirin (or other non - steroidal anti -infl ammatory drugs) ingestion, partial gastrectomy, carcinoma of the stomach, colon or rectum, hookworm,angiodyspasia, colitis, piles, diverticulosis Rarely, haematuria, haemoglobinuria, pulmonary haemosiderosis, self - inflicted blood loss

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**Q:5.** Classify anemia on the basis of morphology with examples.

## **ANS:-**

# **Anemia**

A decrease in haemoglobin level (or total circulating red cell mass) for the age and sex of a person is called as anemia.

## **CLASSIFICATION**

On the basis of morphology and with regard of red cell indices we can classify the anemia into following .

### **1. Microcytic Hypochromic Anaemia**

In this type of anaemia individual RBCs are smaller in size than normal and contain a subnormal amount of haemoglobin.

This type of anaemia is commonly seen in following

- ❖ Iron deficiency
- ❖ Thalassemia
- ❖ Sideroblastic anaemia
- ❖ Anaemia of chronic disorders

### **2. Macrocytic Anaemia**

In this type of anaemia individual RBCs are larger than normal, but the amount of haemoglobin in each cell is usually below normal.

#### **Examples are.**

- ❖ Megaloblastic anaemia
- ❖ Aplastic anaemia
- ❖ Haemolytic anaemia
- ❖ Liver disease

- ❖ Myxoedema
- ❖ Hypopituitarism
- ❖ Pregnancy
- ❖ Alcoholism

### **3. Normocytic Normochromic Anaemia**

In this type of anaemia, although the haemoglobin concentration in the blood is reduced, the individual RBCs appear normal and absolute values are also within normal limits.

#### **Examples are.**

- ❖ Acute blood loss
- ❖ Leukaemia
- ❖ Bone marrow infiltration
- ❖ Chronic renal failure
- ❖ Chronic infections (chronic disorders)

**THANK YOU**