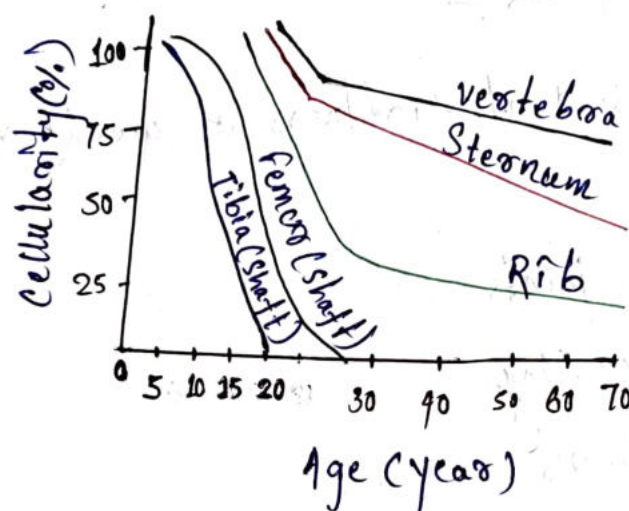
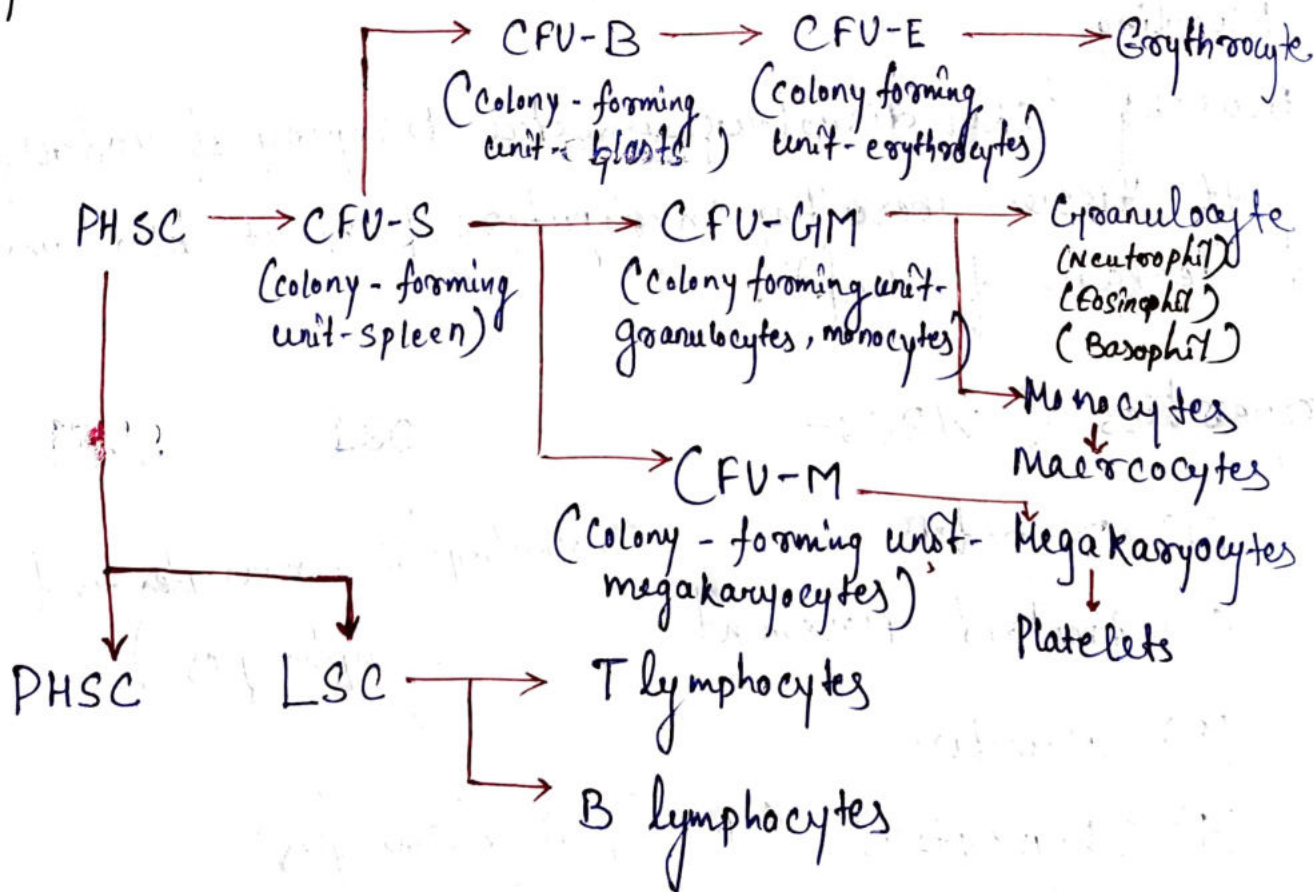


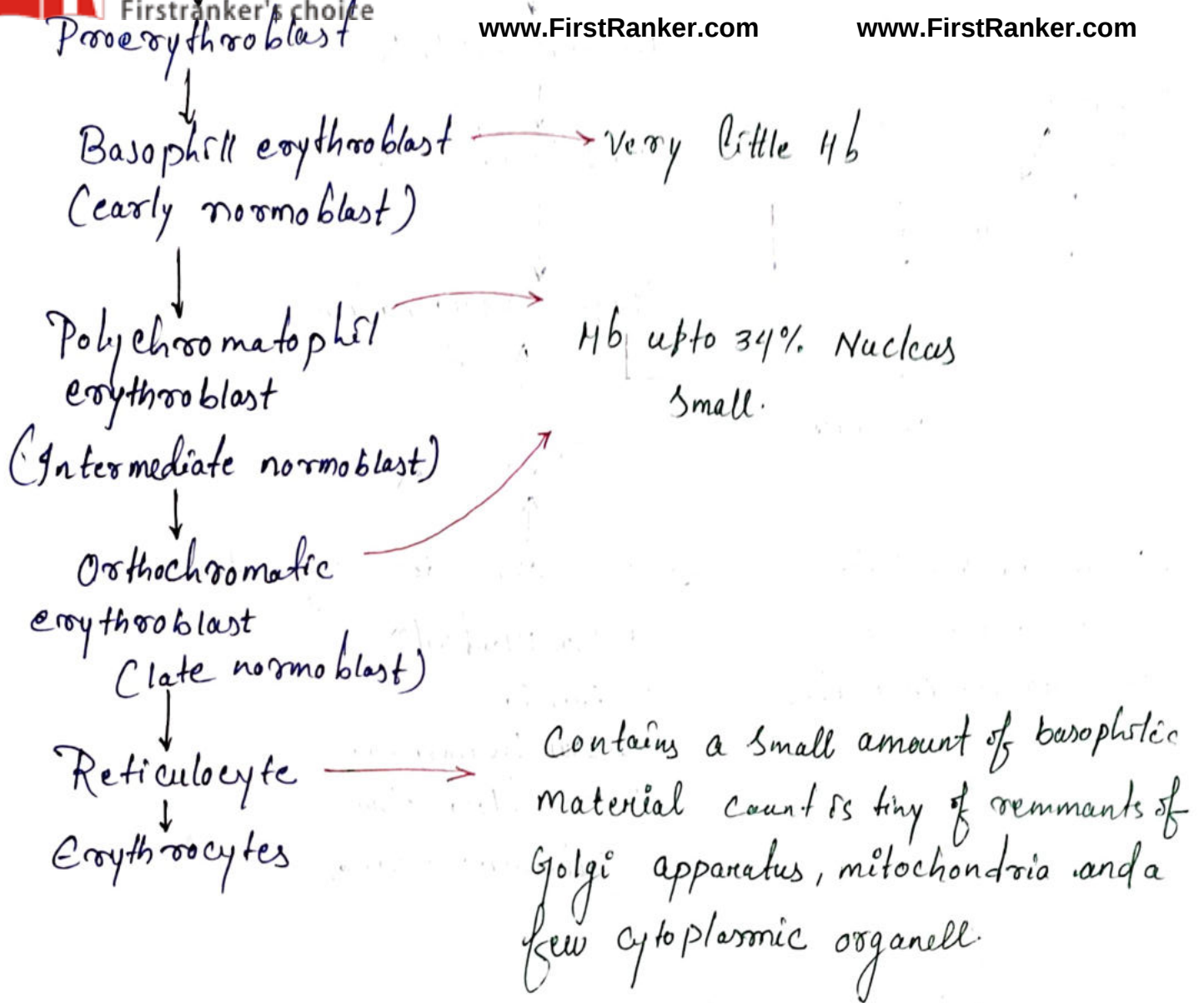
RBC production areas:

Early weeks - Yolk Sac
 middle trimester = liver, some by Spleen & lymph node
 last month & after birth = bone marrow



Genesis:-



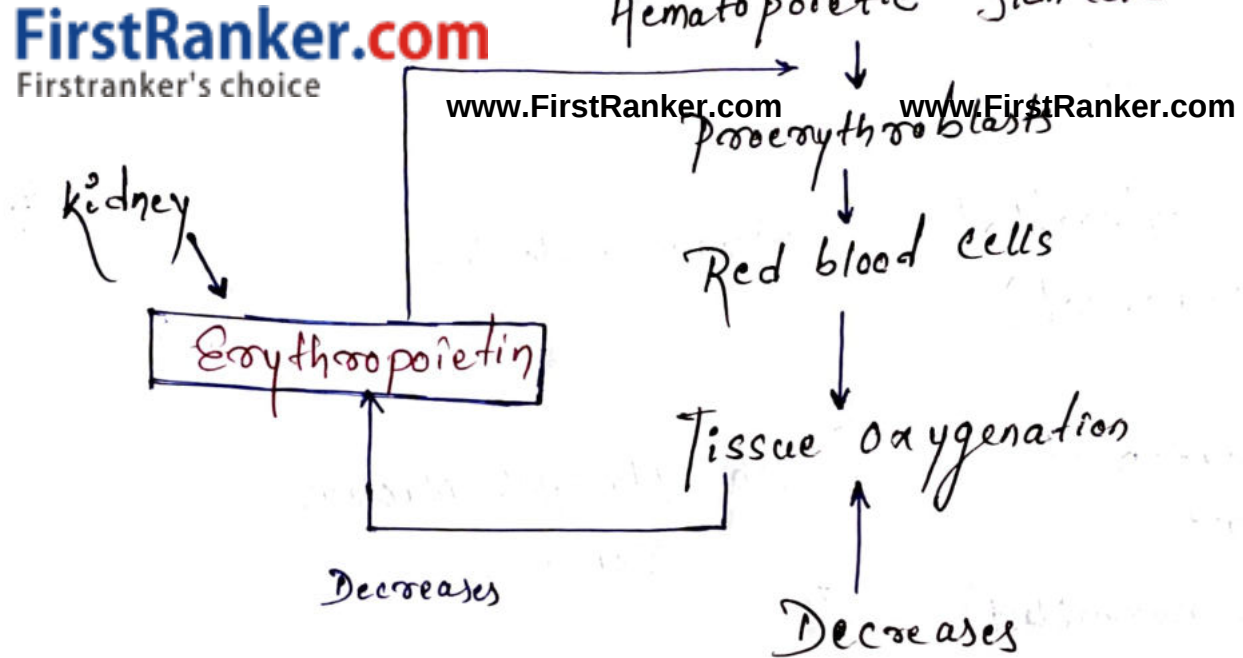


Conditions for High RBC production:-

- (1) Hypoxia
- (2) Anemia
- (3) Various diseases

* The principal stimulus for RBC production in low O_2 states is a hormone called Erythropoietin.

A glycoprotein with molecular wt. of 34000 da



* Hypoxia has little to no effect if erythropoietin is abs.

factors that dec. oxygenation

1. Low Blood vol^m
2. Anemia
3. Low hemoglobin
4. poor blood flow
5. Pulmonary disease

Erythropoietin! —

→ 90% forms in kidney, rest in liver.

Renal tissue hypoxia
↓
↑ level of hypoxia inducible factor-1 (HIF-1)
↓
Induce erythropoietin genes.

* other factors also affect erythropoietin production
norepinephrine and epinephrine and several of prostaglandins

* Each day body need only 1-3 mg of vit B₁₂ and liver & other tissues have 1000 times stored.

Therefore, 3-4 yrs of defective vit B₁₂ absorption are usually required to cause macrocytic anemia

(1) Hypoxia

(2) Dietary Protein

(3) Vit B₁₂

(4) Folic Acid

(5) Pyridoxine

(6) Riboflavin

(8) Vit C (helps Fe absorption)

(9) Vit A

(10) Vit E

(11) Iron

(12) Copper.

Vit B₁₂ & Folic Acid Need:—

↳ cyanocobalamin

→ Def. of either B₁₂ or folic acid causes maturation failure in the process of erythropoiesis.

→ Due to their deficiency, erythroblastic cells will fail to proliferate rapidly and will produce mainly larger than normal cells called macrocytes.

→ These cells will have normal O₂ carrying capacity but have short life, $\frac{1}{2}$ of normal.

* Maturation failure due to poor absorption of Vit B₁₂ will cause pernicious anemia.

Role of Intrinsic factor in absorption:—
of B₁₂

→ Binds tightly with B₁₂.

→ protects B₁₂ from different secretions.

→ Intrinsic factor binds within specific receptor sites on brush border membranes of ileum.

→ Vit B₁₂ is taken by pinocytosis, carrying intrinsic factor together.