**RADIOLOGY SEC B PHYSIOLOGY, 2ND SEMESTER**

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**Discipline: BS Radiology(Sec B)**

**Attempt all questions. Every question carry 10 marks.**

**Q1. Write the functions and composition of blood?**

**Answer:**

**Functions Of Blood:**

**The major functions of blood are;**

**Transport:**

**The main function of blood is transport.**

**Respiration:**

**Blood transport Oxygen and carbondioxide.**

**Trophic:**

**It delivered nutrients materials to the tissues.**

**Excretion:**

**It deliveres metabolites from tissues to excretory organs.**

**Regulation:**

**It transports biologically active substances and harmones.**

**Homeostasis:**

**It maintain water content and acid-base balance.**

**Protection:**

**Immunity and non specific resistance.**

**Blood coagulation.**

**Maintenance of Body temperature:**

**Blood plays an important role in maintaining body temperature.**

**Composition Of Blood:**

**Blood is composed of:**

**1.Plasma:**

* **Liquid part of blood**
* **Pale yellow made up of;**
* **92% water**
* **mineral ions**
* **hormones**
* **CO2**
* **Glucose**
* **protiens etc.**

**2.Formed Elements:**

**RBCs:**

* **Biconcave in shape**
* **4.2- 6.2 million**
* **Life span is 100-120 days**

**WBCs:**

* **5000- 9000 million**
* **Life span is 13-20 days**

**Platelets:**

* **300000 per microlitre of blood.**
* **Life span is 10 days.**

**Q2. What is erythrocyte, erythropoiesis, erythrocytosis and erythropenia?**

**Answer:**

**Erythrocytes:**

**2nd Name:**

**Red blood cells**

**Development:**

**Develop in the bone marrow.**

**Abundance:**

**Abundant type of blood cells.**

**Production:**

**Approximately 2.4 million are produced per second.**

**More Occurance:**

**Approximately a quarter of the cells are red blood cells.**

**Structure:**

**Mature red blood cells are oval biconcave disks and flexible.**

**Life span:**

**Its life span is 100-120 days**

**Cycle:**

**Takes 20 seconds to complete one cycle of circulation.**

**Main Function:**

**The transport of haemoglobin, which in turn carries oxygen from lungs to the tissues.**

**Erythropoiesis:**

**Definition:**

**It is the process by which red blood cells are produced.**

**Stimulation:**

**It is stimulated by decreased O2 in circulation , which is detected by the kidneys, which then secrete the hormone erythropoietin.**

**Process:**

**The whole process lasts about 7days.**

**Rate of Production:**

**Erythrocytes are produced in the bone marrow at a rate of about 2 million per second in a healthy adult.**

**Erythrocytosis:**

**2nd Name:**

**Also called polychythemia.**

**Definition:**

**If the erythrocytes count is more than normal, such state is called erythrocytosis.**

**It can be;**

**Physiological:**

**Due to**

* **High altitude**
* **Exercises**

**Pathological:**

**Due to**

* **Bone marrow disorder**
* **Any cardiovascular or respiratory disease.**

**Erythropenia:**

**Definition:**

**A decrease in the number of erythrocytes.**

**Physiological:**

**Due to**

* **Deficiency of production**
* **Pregnancy**

**Pathological:**

**Due to**

* **Bone marrow disorder**
* **Any kidney disease**

**Q3. What is platelets and write about clotting mechanism and its all steps?**

**Answer:**

**Platelets:**

**2nd Name:**

**Thrombocytes**

**Definition:**

**A component of blood whose function is to react to bleeding from blood vessel injury by clumping, thereby initiating blood clott.**

**No cell nucleus**

**Fragments of cytoplasm**

**Life Span:**

**10 days**

**Functions:**

* **Stop bleeding**
* **Maintain homeostasis**

**Clotting mechanism**

**Clotting Mechanism and Its Steps:**

**Initiation:**

**Instantly after an injury to the blood vessel which has damaged the endothilium lining of the vessel.**

**Mechanism involves;**

**Adhesion:**

* **Blood comes into the space under endothelium**
* **Underlying collagen exposed to circulating platelets.**
* **Platelets bind with surface receptors of collagen and adhere tightly.**

**Activation:**

* **Platelets change shape**
* **Turn on receptors and secrete chemical messengers to activate and invite additional platelets.**
* **Activated platelets adhere tightly at injury site.**

**Aggregation:**

* **Platelets connect to each other through receptor bridges.**
* **Platelet plug formed at injury site unless the interruption is physically too large.**

**Fibrin Deposition:**

* **Formation of platelet plug will ensure primary hemostasis.**
* **Now fibrin deposition start and thus started seconday hemostasis.**
* **Thus fibrin clott formed .**

**Coagulation:**

**Definition:**

**The formation of blood clott.**

**Stages:**

**Stage 1:**

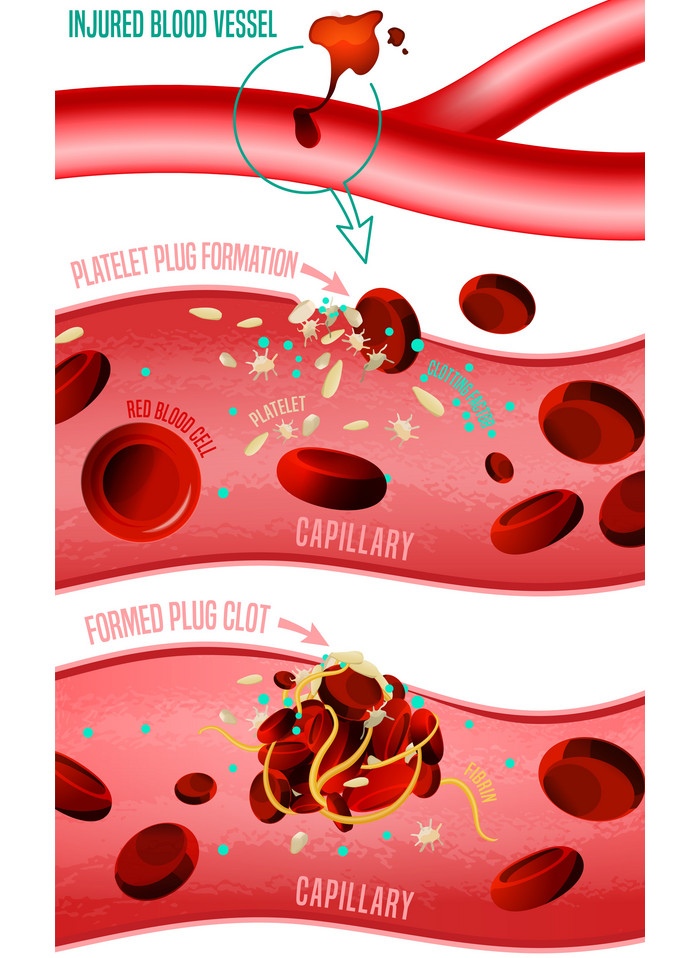
**Platelets attack to the endothelium.**

**Stage 2:**

**Platelets start to release fibrin and begin to seal the endothelium.**

**Stage 3:**

**The fibrin network traps the RBCs and completely seal the endothelium.**

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**Q4. Write a detail note on ABO system?**

**Answer:**

**ABO System:**

**Average Worlwide:**

* **O 47%**
* **A 41%**
* **B 9%**
* **AB 3%**

**Invention:**

**Invented by Karl Landsteiner**

**Inherit:**

**Inherited from parents**

**Base on A and B antigens- agglutinogens**

**May have;**

* **Neither of them**
* **One of them**
* **Both of them**

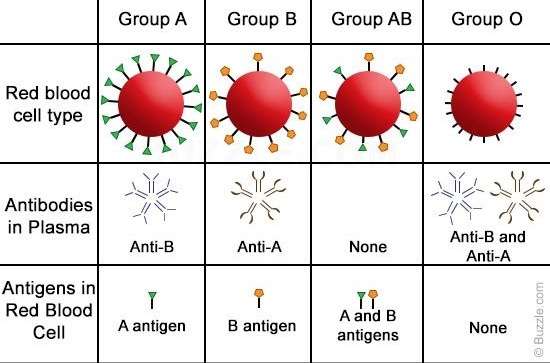
**Agglutinogens:**

**On the surface of RBCs**

**Agglutinins:**

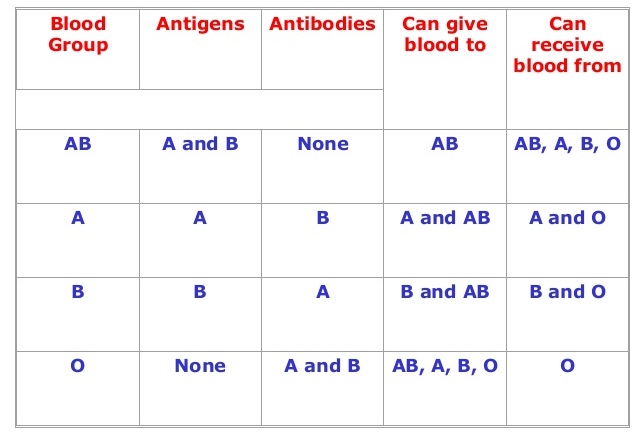
**In blood plasma**

**Can cause blood transfusion reactions.**

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**Role Of Blood Groups In Blood Transfusion:**

* **Blood typing is compulsory in blood transfusion.**
* **If the blood is not matched the hemolysis occur.**

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**Complications Of Blood transfusion with reference to ABO Incompatibility:**

**If mismatched blood has transfused then following complications can occur;**

* **Acute hemolysis**
* **Jaundice**
* **Kidney shutdown etc.**

**Q5.(i) A person fell down from a tree and become unconscious, with bleeding from head, what will you do as a first aid?**

**Answer:**

**Opinion:**

* **If a person fell down from a tree and become unconcious, with bleeding from head so i will take the following steps as a first aid;**
* **First i will correct his position by laying in safe place e.g bed because of unconciousness his position will not correct.**
* **As a medical student i have already first aid kit, so for bleeding i will use bandages to stop it blood flowing.**
* **The i will check his pulse rate and blood pressure.As the patient are in the state of unconciousness so, it could not realize its pain, so then i will took it for more diagnosis to the hospital where its x.ray etc will be done and followed the better medications.**

**(ii) you have to meet with your friend and you came to know he is covid positive, what precautionary measures will you take?**

**Answer:**

**Opinion:**

* **When i became know that my friend's corona test is positive.So, first of all i will isolate myself in a room and will told the family members not to meet with me till i will do my test and confirmed to be negative.**
* **Then i will do my test and till the test result i will never go out from my isolation room and will use the mask, specific medications, gloves , separate utensils (disposible) for eating meals.**
* **Use of dettol while bathing and having keep a sanitizer.**
* **If the test result became negative then its better and will leave the isolation room and if the test became positive so i will be in my isolation room for at least 14 days and will follow the above precausionary measures as in the daily routine.**

**The End**