NAME: WOKOMA OLOBO BENEBO
COURSE: ANA 204
DEPARTMENT: MEDICAL LABORATORY SCIENCE
MATRIC NUMBER:18/MHS06/055

ASSIGNMENT!!!

1. Critically examine the
renal function of desert dwellers and the anatomical basis of their
unique adaptation

2. Write extensively on the clinical importance of the glomerular filtration barrier.

ANSWER FOR NUMBER 2

2. The glomerular filtration barrier is a highly specialized blood filtration interface that displays a high conductance to small and midsized solutes in plasma but retains relative impermeability to macromolecules. Its integrity is maintained by physicochemical and signaling interplay among its three core constituents — the glomerular endothelial cell, the basement membrane and visceral epithelial cell (podocyte). The glomerular filtration barrier determines the composition of the plasma ultra filtrate. It restricts the filtration of molecules primarily on the basis of size.In the clinic, A reduction in GFR in disease states is most often due to decreases in the ultrafiltration coefficient (Kf) because of the loss of filtration surface area.

ANSWERS FOR NUMBER 1.

1. Kidneys of desert animals have a longer loop of Henle to make the animal's urine as concentrated as possible and limit the amount of water and salt they lose. This helps desert animals live for long periods of time on minimal amounts of water. anatomical basis of their unique adaptation.
From the accompanying diagram you would be able to see that the Henle's loop of juxtamedullary (=adjacent to medulla of kidney) nephron goes deep down into the medulla. According to this diagram above the henle's loop of juxtamedullary nephron of deserts animals like camel goes deep down into the medulla this is why medulla of camel's kidney is thicker than that of other mammals, but it is most well developed in another desert mammal, the kangaroo rats. The Henle's loops of juxtamedullary nephrons along with counter flowing blood vessels, called vasa recta, help in conservation of water. Blood first flows along ascending limb of Henle, which is impermeable to water. Solutes can leave the filtrate and enter the blood along this stretch. When this blood flows along descending limb, water is reabsorbed from filtrate but not the solutes. Longer the Henle's loop, more amount of solute will be reabsorbed and hence more amount of water could be removed from filtrate.