**NAME: ODOK-OGAR DIVINE ONYODUMA**

**MATRIC NO: 18/MHS05/009**

**DEPARTMENT: PHYSIOLOGY**

**COURSE: ANA 204**

**QUESTIONS:**

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.**

**ANSWERS**

1. Renal adaptations of desert vertebrates may involve regulation of urine osmolality and glomerular filtration rate. Changes in the latter may influence the former. Excretory end products of nitrogen metabolism may influence urine osmolality, excretion of water, and excretion of inorganic ions. These are integrated with other physiological and behavioural mechanisms for desert survival.
2. The main function of the glomerulus is to filter [plasma](https://en.wikipedia.org/wiki/Blood_plasma) to produce glomerular filtrate, which passes down the length of the [nephron](https://en.wikipedia.org/wiki/Nephron) tubule to form urine. The rate at which the glomerulus produces filtrate from plasma (the [glomerular filtration rate](https://en.wikipedia.org/wiki/Renal_function#Glomerular_filtration_rate)) is much higher than in systemic capillaries because of the particular anatomical characteristics of the glomerulus. Unlike systemic capillaries, which receive blood from high-resistance [arterioles](https://en.wikipedia.org/wiki/Arteriole) and drain to low-resistance [venules](https://en.wikipedia.org/wiki/Venule), glomerular capillaries are connected in both ends to high-resistance arterioles: the [afferent arteriole](https://en.wikipedia.org/wiki/Afferent_arteriole), and the [efferent arteriole](https://en.wikipedia.org/wiki/Efferent_arteriole). This arrangement of two arterioles in series determines the high [hydrostatic pressure](https://en.wikipedia.org/wiki/Hydrostatic_pressure) on glomerular capillaries, which is one of the forces that favour filtration to the Bowman's capsule. If a substance has passed through the glomerular capillary endothelial cells, [glomerular basement membrane](https://en.wikipedia.org/wiki/Glomerular_basement_membrane), and [podocytes](https://en.wikipedia.org/wiki/Podocyte), then it enters the [lumen](https://en.wikipedia.org/wiki/Lumen_%28anatomy%29) of the tubule and is known as glomerular filtrate. Otherwise, it exits the glomerulus through the efferent arteriole and continues circulation as discussed below and as shown on the picture.