2M) Functions of water:-

1. water provides the aqueous medium to the organism which is essential for various biochemical reactions to occur.
2. water directly participates as a reactant in several metabolic reactions.
3. It serves as a vehicle for transport of solutes.
4. water is closely associated with the regulation of body temperature.

Distribution of water in an adult man, weighing 70 kg.
2M) (Name the diff. fluid compartments in the body)

Compartment	% Body weight	Volume (l)
Total	60	42
Intracellular fluid (ICF)	40	28
Extracellular fluid (ECF)	20	14
Interstitial fluid	15	10.5
plasma	5	3.5

Water Turnover & Balance

In a healthy individual, the water is balanced by regulating daily water intake & water output.

Water intake :- water is supplied to the body by Exogenous & Endogenous water.

Exogenous water:- Ingested water & beverages, water content of solid foods constitute the Exogenous source of water. water intake ranges from 0.5-5L. It depends on the social habits & climate. In general people living in hot climate drink more water. Ingestion of water is mainly controlled by a thirst center located in the hypothalamus. Increase in the osmolality of plasma causes increased water intake by stimulating thirst center.

Endogenous water:- The metabolic water produced with in the body is the endogenous water. This water (300-350 ml/day) is derived from the oxidation of food stuffs. It is estimated that 1g of carbohydrate, protein & fat, respectively, yield 0.6ml, 0.4ml & 1.1ml of water. On an average about 125 ml of water is generated for 1,000 cal consumed by the body.

Water output :-

water is eliminated by the body through 4 distinct routes - urine, skin, lungs & faeces.

(2M) what is the role of Kidneys in water balance.

(1) Urine :- Major route for water loss from the body. In a healthy individual 1-2 lts/day of urine output is observed. But the Excretion of water through Kidneys is variable. Kidneys regulate water content of body to meet the body demands. Some amount of water is essential as a medium to eliminate the waste products from the body.

(2) Hormonal regulation of urine production :-

water Excretion through Kidneys is controlled by vasopressin also known as Antidiuretic Hormone of the posterior pituitary gland.

The Secretion of ADH is regulated by the Osmotic pressure of plasma.

An increase in Osmolality promotes ADH Secretion that leads to increase the water reabSorption from the renal tubules (less urine output). On the other hand, a decrease in Osmolality Supresses ADH Secretion; results in reduced water reabSorption from renal tubules (more urine output). plasma Osmolality largely depends upon Sodium Concentration, hence Sodium indirectly controls the amount of water in the body.