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B.Sc HONS Part-III Paper-VI

Topic:- Permeability of Plasma-membrane,

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Q. ●. Write an essay on permeability of plasma-membrane.

Ans. Cells are in constant need of certain substances to regulate various vital activities. These substances are oxygen, mineral salts and nutrients. Besides intake of these substances, excretion of waste products such as ammonia, CO_2 and other metabolites is also needed. For exchange of these materials plasma membrane acts as a gate way and regulates the flow of materials in and out of the cell. This property of membrane is known as permeability.

All processes involved in the exchange of materials are categorised primarily into following three main types-1. Passive transport 2. Active transport 3. Cytosis.

1. Passive Transport: The passage of molecules through the membrane from a high concentration to a low concentration region is called passive

transport. Transfer of molecules takes place along the concentration gradient and no energy is required.

(a) Simple Diffusion : Transport of metabolites across the membrane along the concentration gradient and without the use of a carrier molecule is called Simple diffusion.

(b) Facilitated Diffusion : Transportation of molecules across the plasma membrane in response to a concentration gradient by a carrier is known as facilitated diffusion. It is stereo specific i.e. only one of the two possible isomers (L or D) is transported.

2. Active Transport : It appears to be of two general types—

(a) Primary Active Transport : It is directly related with chemical energy (ATP) or electric energy (Electron flow). Examples of primary active transport are Na^+ , K^+ translocating ATPase in mammals and proton translocating ATPase of bacteria .

The existence of sodium and potassium pumps has been demonstrated in many eukaryotic cells. Na^+ is pumped out of the cell by the sodium pump and K^+ is pumped into the cell by a coupled process. The two pumps apparently operate simultaneously, and in the absence of either Na^+ or K^+ movement of both Na^+ and K^+ stops.