ACTIONS AND ADMINISTRATION OF POISONS:

The action of almost all the poisons is the same. They either stop the supply of oxygen to the body tissues or inhibit the enzymes associated with the respiration mechanism and the person dies due to stoppage of oxygen availability. However, the mode of stoppage varies e.g. insecticides and pesticides are powerful inhibitors of cholinesterase. The site of action is said to be at the myoneural junctions and synapses of the ganglions. At these sites, normally, acetylcholine is liberated from nerve stimulation. The liberated acetylcholine is hydrolysed into choline and acetic acid by cholinesterase. In poisoning by insecticides and pesticides, the activity of cholinesterase is inhibited, acetylcholine therefore accumulates and results in hyper excitation of the voluntary and involuntary muscles. A drop in the activity of cholinesterase to 30 per cent of normal or lower is associated with toxic symptoms and leads to death resulting from respiratory failure or circulatory arrest.

In carbon monoxide poisoning, the gas having greater affinity combines easily with haemoglobin and make them unable to carry oxygen to various tissues of the body. The glycoside poisons affect the heart muscles and the pumping of blood is stopped. Opiates, alcohols, barbiturates, dhatura etc. paralyse the respiratory centers of the brain resulting in respiratory failure.

The action of poisons may be

* local,
* remote,
* local & remote combined or general.

The local action means its direct action on the tissues and cause corrosion e.g.

strong mineral acids and alkalis, irritation and inflammation in cantharides or some nervous effects as in the case of dilation of the pupil by atropine.

Remote action results from the absorption of the poison into the system e.g. alcohol, alkaloids or other drugs affect the organs after being absorbed into the system.

Some poisons produce both local and remote actions. In such cases, there is destructive action on the tissue with which they come in contact and there is also a toxic affect after absorption e.g. oxalic acid.

General action results when the absorbed poison evokes responses from a wide variety of tissues beyond one or two systems e.g. arsenic, mercury, insecticidal compounds etc.

Most of the poison affects the person immediately, if not, the poison is eliminated from the body by excretions or gets metabolised or detoxified into non-toxic metabolite which is eliminated slowly. However, some poisons have tendency to get accumulated in the body tissues and when a fatal level is reached, the person dies. Arsenic and DDT are among such poisons, which have been reportedly used as slow poisons since ages for homicidal purposes. The absorption of DDT through skin and accumulation behaviour may result into accidental death.