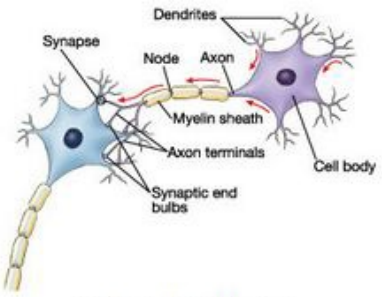
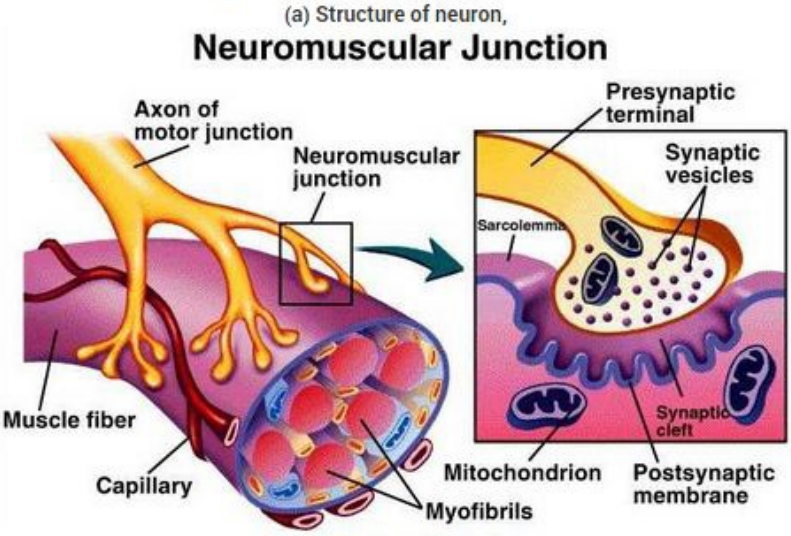
Question 1. What is the function of receptors in our body?
Solution:
Receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect smell.

Question 2. Draw the structure of neuron and explain its function.
Solution:



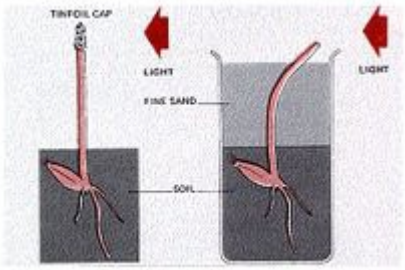
(a) Structure of neuron,

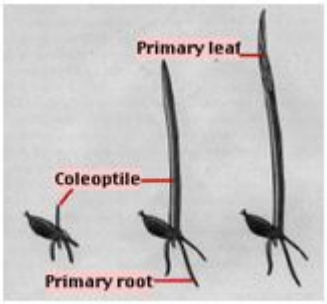


(b) Neuromuscular junction

The specialised tips of some nerve cells detect all information from our environment. These receptors are usually located in our sense organs, such as the inner ear, the nose, the tongue, and so on. So gustatory receptors will detect taste while olfactory receptors will detect smell. This information, acquired at the end of the dendritic tip of a nerve cell, sets off a chemical reaction that creates an electrical impulse. This impulse travels from the dendrite to the cell body, and then along the axon to its end. At the end of the axon, the electrical impulse sets off the release of some chemicals. These chemicals cross the gap, or synapse, and start a similar electrical impulse in a dendrite of the next neuron. This is a general scheme of how nervous impulses travel in the body. A similar synapse finally allows delivery of such impulses from neurons to other cells, such as muscles cells or gland. It is thus no surprise that nervous tissue is made up of an organized network of nerve cells or neurons, and is specialised for conducting information via electrical impulses from one part of the body to another.

Question 3. How does phototropism occur in plants?
Solution:





Phototropism is a growth movement induced by a light stimulus. Growth towards a source of light is called positive phototropism, that away from the source is termed negative phototropism. The tips of shoots are usually positively, that of roots negatively phototropic.
Charles Darwin and his son Francis discovered (in 1880) that the phototropic stimulus is detected at the tip of the plant.
The Darwins used grass seedlings for some of their experiments. When grass seeds germinate, the primary leaf pierces the seed coverings and the soil while protected by the coleoptile, a hollow, cylindrical sheath that surrounds it. Once the seedling has grown above the surface, the coleoptile stops growing and the primary leaf pierces it.
The Darwins found that the tip of the coleoptile was necessary for phototropism but that the bending takes place in the region below the tip.
If they placed an opaque cover over the tip, phototropism failed to occur even though the rest of the coleoptile was illuminated from one side.
However, when they buried the plant in fine black sand so that only its tip was exposed, there was no interference with the tropism - the buried coleoptile bent in the direction of the light.
From these experiments, it seemed clear that

- The stimulus (light) was detected at one location (the tip)
- The response (bending) was carried out at another (the region of elongation).
- This implied that the tip was, in some way, communicating with the cells of the region of elongation.

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