TickMark.Ai
Mumbai

Class: EM - CLASS 9 | **Subject:** Science and Technology - Part 2 | **Time:**2 hrs
Date: 28-02-2025 | **Paper:** Semester 2 (Solution) | **Marks:**40

Q1(A))
(1) Neurons
(2) Hubble, Chandra
(3) vacuoles
(4) tissue
(5) baby girl

Q1(B))
(1) True
(2) INSAT and GSAT
(3) Reflex action is process carried out by Spinal cord while remaining are different parts of Nervous system.
(4) 44 + XXY
(5) Khillari

Q2(A))
(1) i. 'Livestock' means the domestication of animals for profit or use.
ii. Sheep provides us with wool, skin and meat.
iii. The fine soft wool obtained from sheep is in great demand worldwide.
iv. Their excreta are highly nitrogen rich which makes farm naturally fertile.
v. There is no need to spend lots of money for the maintenance of the sheep.
vi. They are better resistance to the diseases and are easily manageable due to their small size.
vii. Therefore, rearing of sheep is a livestock.
(2) i. Molecules of DNA are present in all the organisms i.e. from viruses and bacteria to human beings.
ii. The molecules which control the functioning, growth and division of the cell are called 'Master Molecules'.
iii. DNA molecules not only control the functioning of the cell but also control their growth, development as well as division (reproduction).
iv. Therefore, DNA molecules are called Master molecules.
(3) i. Biochemical reactions constantly occurring in the cell produces several unwanted harmful substances like urea, uric acid etc. along with useful products.
ii. If these substances accumulate in the body for long, it can lead to serious harm or even death. Hence, it is necessary to remove harmful and waste substances from the body.

Q2(B))
(1) i. No. The structures and functions of the bodies of plants and animals are not same.
ii. Growth of plants takes place only in certain limited area and they are sedentary.
iii. They do not possess nervous system. In case of animals, they move from place to pace in search of food, water, etc.
iv. Hence, they require more energy.
v. Their growth is uniform throughout the body and they have different systems for different functions.
(2) Monohybrid Cross:
i. Monohybrid cross is a cross between two plants with only one pair of contrasting characters.
ii. F_1 hybrid of monohybrid cross produces two types of gametes.
iii. Gametes produced by F_1 hybrid are similar to gametes produced by the P_1 generation.

iv. Phenotypic ratio in F_2 generation of monohybrid cross is 3:1.

Dihybrid Cross:

i. Dihybrid cross is a cross between two plants with two pairs of contrasting characters.
ii. F_1 hybrid of dihybrid cross produces four types of gametes.
iii. Only two gametes out of four produced by F_1 hybrid are similar to those of the P_1 generation.
iv. Phenotypic ratio in F_2 generation of dihybrid cross is 9:3:3:1.

(3) i. Hubble telescope is an optical telescope which was launched into space in 1990 by National Aeronautics and space Administration.
ii. It consists of a mirror whose diameter is 94 inches.
iii. It orbits the earth at a height of 589 km from it.
iv. This telescope is still working and has helped to make important discoveries.

(4) i. **Adrenal:** Its outer part secretes corticosteroids and inner parts secrete adrenaline and non-adrenaline.
ii. **Adrenaline and Nor-adrenaline:** It controls behaviour during crisis and emotional situations. It also stimulate heart and its conducting tissue and metabolic processes.
iii. **Corticosteroid:** It maintains balance of Na and K and stimulates metabolism.

(5) Adenine, Guanine, Cytosine and Thymine.

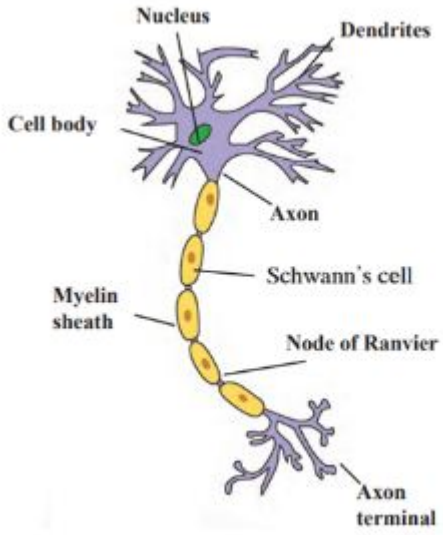
Q3)

(1) (1) The telescope in which light rays get reflected by mirrors is called as reflecting telescope.
(2) The images formed by mirrors do not have errors of colour whereas error of colour occurs in lenses. Other than that the weight of a large mirror is less than that of a lens of the same size.
(3) By using large mirrors, we can get a bright image of a source.

(2)

Types	Location	Function
Apical meristem	At the tip of the root and stem	Increases the length of the root and stem.
Intercalary meristem	At the base of the petiole of leaves and of branches.	Growth of branches, formation of leaves and flowers.
Lateral meristem	Lateral sides of root and stem	Increases girth (diameter) of the root and stem

(3)



(4) i. With the help of the technique it has become possible to produce plants and animals bearing some new characteristics in addition to their natural ones.
ii. The techniques of bringing about improvements in living organisms by artificial genetic changes and by

hybridization for the welfare of human beings, are together called 'Biotechnology'.
iii. It includes the techniques of genetic engineering and tissue culture.
iv. Its uses are in the production of cash crops, improvement in varieties of cash crops, increase in abilities of plants to withstand environmental stresses.
v. Also, vaccine production, early diagnosis of congenital diseases, organ transplant, cancer research, production of artificial skin, cartilage, etc. in laboratories is possible due to Biotechnology.

(5) i. The white revolution in India was a program launched to raise the milk production in India.
ii. Dr. Verghese Kurien was the pioneer of white revolution.
iii. The white revolution has transformed India as the largest producer of milk globally with 17% of the global production.
iv. The per capita availability of milk increased from 130 gm/day in 1950-51 to 300 gm/day in 2013-14.
v. It brought a good rural development.

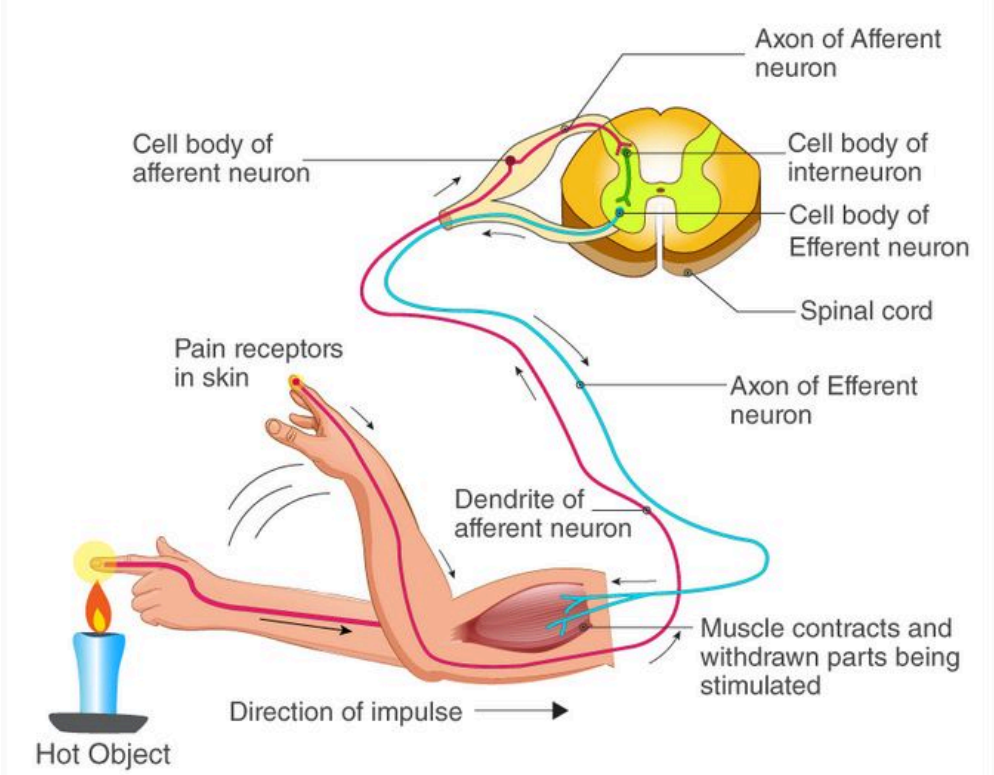
(6) DNA, nucleotides, linearly, proteins, hereditary, functional

(7) i. Plants being sedentary, most of their tissues are of the type that give support.
ii. There are dead cells in some tissues and these do not need much attention.
iii. Growth of the plants occurs in specific parts of their body where the tissues contain dividing cells.
iv. As animals have to move from place to place in search of food, shelter and partners, their energy needs are greater.
v. Most of the tissues of animals are made up of living cells. Uniform growth occurs through out the body of an animal and they do not have different dividing and non-dividing tissue.
vi. This means that plants and animals have different types of tissue to performing the necessary functions.

(8) i. The central nervous system consists of the brain and spinal cord.
ii. Cerebrum consists of two cerebral hemispheres.
iii. These hemispheres are joined with each other with the help of tough fibres and nerve tracts.
iv. The cerebrum occupies two-thirds of the brain. Hence, it is also called the large brain.
v. Its surface has deep, irregular ridges and grooves which are called convolutions.
vi. Convolution increases the surface area of the cerebrum and therefore a large number of nerve cells can be accommodated.

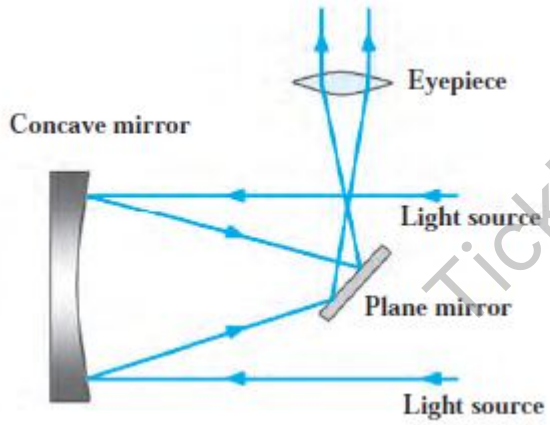
Q4)

(1) i. An immediate and involuntary response given to a stimulus from the environment is called a reflex action.
ii. Sometimes we react to an incident without any thinking on our part or control over the reaction. This is a response given to a certain stimulus from the surroundings.
iii. In such situations, proper control and co-ordination is achieved even without intervention of the brain (i.e. it is not controlled by brain) and this is how reflex action comes in exist.
iv. The path of reflex action is as follows: Sense organs → Sensory neurons → Towards the spinal cord → Coordination neuron → Motor neutron → Muscle or gland This path is also known as reflex arc.
v. Due to reflex action, person is saved from dangerous situations and load on the brain is reduced.



(2) (1) The above figure shows Newtonian telescope, which is a type of reflecting telescope.

(2)



(3) Newtonian telescope uses concave mirror and plane mirror.

(4) The type of telescope uses a curved mirror is Cassegrain telescope.

(5) i. A Newtonian telescope consists of a concave mirror, a plane mirror and a lens (for eye piece).

ii. Light rays coming from space are reflected by the concave mirror.

iii. Before these reflected rays converge at the focus, they are deflected again by a small plane mirror.

iv. Then, they get focused at a point lying perpendicular to the axis of the telescope's cylinder.

v. They pass through the eyepiece and a magnified image of the source is obtained.

All the Best