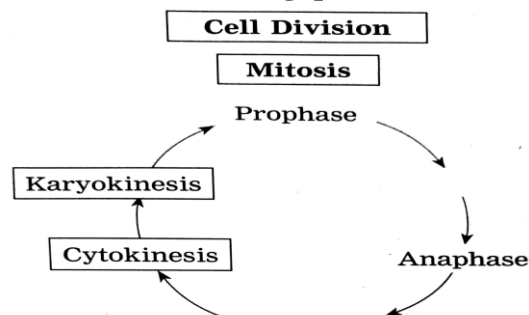


Q.1 A) Solve the following questions

1)



2) Full form of NADP: Nicoteneamide Adenine Dinucleotide Phosphate.

3) Binary Fission: One cell divides into two cells.

Multiple Fission: One cell divides into many cells.

4) 1) Microbes-containing inoculants are produced by process of fermentation. 2) They are used for spraying on seeds before sowing. Some of them are released into plants.

5) Biofuels is a good and renewable type of energy. They are easily available and in abundance, hence they are called reliable fuels of the future. Biofuel is available in the following three forms: Solid: Coal, dung, crop residue

Liquid: Vegetable oils, alcohol

Gaseous: Gobar gas and coal gas.

B) Complete the following chart

Type	Character	Example
Cyclostomata	<u>Jaw less mouth with sucker</u>	<u>Petromyzon</u>
<u>Pisces</u>	Gill respiration	<u>Rohu</u>
Amphibia	<u>Aquatic respiration as well as aerial respiration</u>	<u>Frog</u>
<u>Mammalia</u>	<u>Mammary glands</u>	What, cat, Man
<u>Reptiles</u>	Poikilotherms	<u>Tortoise</u>

Q.2 Answer the following questions. (Any Five)

1)

	Monozygotic Twins	Dizygotic Twins
1)	Two children developing from one zygote only are called monozygotic twins.	Two children developing from two different zygotes are called dizygotic twins.
2)	Monozygotic twins develop from same oocyte.	Dizygotic twins develop from two different oocytes.
3)	Gender of both the twins is same.	Gender of both the twins can be same or can be different.
4)	The monozygotic twins are genetically exactly alike.	The dizygotic twins are genetically not exactly alike.

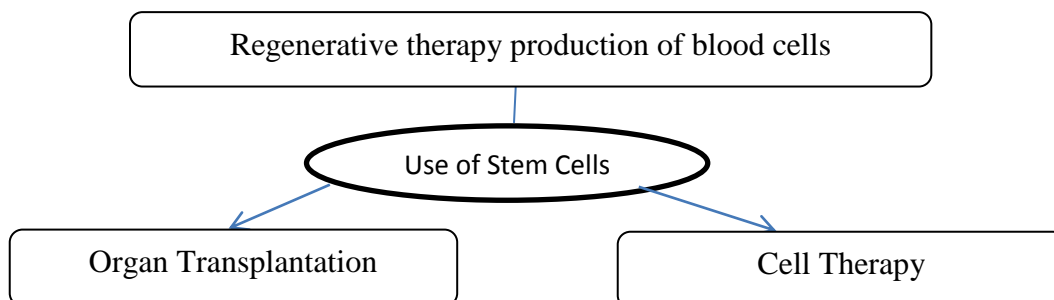
2) Advantages: 1) While generating the power through solar radiations, no fuel is burnt. 2) Solar energy generation thus does not create any type of pollution. The technology can be completely utilized in regions with abundant sunlight. 3) Solar energy is eco-friendly, green energy.

Limitations: 1) Sunlight is available only during day time. Thus solar cells can generate power only during day. 2) In rainy season and in cloudy conditions, solar power generation suffers. 3) The power present in the solar cells is DC while most of the domestic equipments work on AC.

- 3) When the carbon dating method was used to assess the age of fossils, it was understood that invertebrates were present on the earth much before the vertebrates. The fossils of invertebrates are present in lower layers of earth's strata. They were seen in Palaeozoic era of geological time period. Vertebrates dominated during Coenozoic era. Their fossils are seen in the upper strata of the earth's crust. The structural complexity also increased in vertebrates. All these facts indicate that vertebrates have been slowly originated from invertebrates.
- 4) Classification:
Kingdom: Animalia, Phylum: Chordata, Class: Aves,
Characters: Penguin is a flightless bird inhabitant of cold snow-clad regions. It has exoskeleton of feathers. The body is well adapted to survive in cold regions. It is a warm-blooded bird. The forelimbs are modified into wings. But due to excessive body weight, the penguins are not seen flying. It can wade in the water with modified hind limbs.
- 5) When there is deficiency of oxygen in the surrounding, the aerobic respiration is not possible. In such case, to survive, higher plants switch over to anaerobic respiration. In some animals tissues in case of oxygen deficiency cells perform anaerobic respiration.
- 6) From biomass, the biogas and biodiesel are mainly obtained. The biogas is obtained from dung of cattle. The fermentation of cattle dung gives rise to methane. From methane, methanol is obtained. Ethanol; is obtained from molasses of sugarcane. Some crops also give ethanol. In some countries, special crops are cultivated for the biodiesel.
- 7) Sacred grove is the green patch of the forest which is conserved by local people in the name of God. It does not belongs to forest department. It is like a sanctuary that is conserved by the common people and tribals in the area. It is rich in the biodiversity. It is conserved as there is a faith that God or deity reside in the sacred grove. Hence in local language, they are known as Deorai. Due to this reason, people do not cut the trees. Also hunting of any wild life is not done here. More than 13000 sacred groves have been reported in India. Most of these are in Western Ghats in Maharashtra, Karnataka and Kerala. Also, in remaining parts of India sacred groves are reported. Role of sacred grove is tremendous in conserving the biodiversity.

Q.3 Answer the following questions. (Any five)

- 1) i) AUG is the initiation codon, which is present on the mRNA.
ii) There are two molecules of tRNA present inside the ribosome. The triplet codons present on them are UAC and AAG respectively.
iii) The mRNA that leaves the nucleus has genetic code: A U G U U C A A A
The genetic code on DNA therefore should be as follows: T A C A A G T T T
- 2) 1) ATP or Adenosine triphosphate is the 'energy currency' of the cell. 2) Chemical composition of ATP is as follows: it is a triphosphate molecules having adenosine ribonucleoside. The nitrogenous compound – adenine, pentose sugar – ribose and three phosphate groups are present in ATP. 3) In this energy-rich molecule the energy remains trapped in the bonds by which phosphate groups are attached to each other. 4) ATP molecules are stored in the cells. As per the need, energy is derived by breaking the phosphate bond of ATP. 5) During cellular respiration, the oxidation of glucose yields 38 molecules of ATP. Whenever required they are consumed to liberate energy.
- 3) Write the correct answer in blank circles.



- 4) Speciation: 1) Formation of a new species of living organisms is called speciation. 2) Darwin has

proposed that speciation is due to evolution. 3) Each species has its own specific geographical conditions. There is difference in the food, habitat, reproductive ability and period, etc. 4) Such genetic variation helps in the formation of new species from old one. 5) Moreover, geographical and reproductive changes are responsible for speciation. 6) Species is the group of organisms that can produce fertile individuals through natural reproduction. Therefore, they get isolated from other species and are not able to perform reproduction with them.

- 5) 1) IVF means In Vitro Fertilization (IVF). 2) This is the technique in the modern medical field where childless couples can be blessed by their own child. 3) IVF technique is used for childless couples who are facing with problems such as less sperm count, obstacles in oviduct, etc. 4) The IVF technique is done by removing the oocyte from the mother and artificially fertilizing by the sperms collected from father. This fertilization is done in a test tube. Thus it is also called test tube baby. The embryo formed is implanted in uterus of real mother or a surrogate mother at appropriate time.
- 6) 1) Natural characters of some species may not have all useful features. Some of the characters may be deleterious. In order to avoid such varieties, GMO or Genetically Modified organisms are created. For this purpose, the DNA is changed in the crops. The modified crops then possess required features. 2) Following changes have occurred in the crops due to biotechnology. The varieties that can withstand the changes in the environment can be created. E.g., constantly changing temperature, dry and wet droughts, climate change and some similar stress-resistant varieties are produced through genetic engineering. 3) GM crops are resistant to insect pests, pathogens, chemical weedicides, etc., due to their changed genome. This reduces the use and the cost of chemical pesticides which are harmful. 4) Due to use of seeds of GM crops, there is improvement in nutritive value of crops. Therefore now, seeds of a better quality crops are being produced. 5) There is also a decrease in loss of crops. Subsequently there is increase in the cultivable land and agriculture. 6) Some insect resistant crops such as Bt Cotton have been produced which is widely used in Maharashtra.
- 7) In life, the time once spent never returns back. We therefore must use our time for studies, exercise or outdoor games and some entertainment. In the free time, we must also help our parents in house hold work. But if we are spending hours together on surfing the net without any perfect aim or playing the computer or cell phone games it is total waste of time. There are many inappropriate sites on the internet, which should not be watched. This causes stress. Continuous use of mobile phone and being hooked to the social media slowly becomes an addiction. If these bad habits are creeping in us, we must try to leave the habits by conscious change.

Q.4 Answer the following question. (Any one)

- 1) Read the paragraph and answer this following question's given below
- Annelidans have parapodia and setae as the locomotory organs.
 - Phylum Arthropoda has a characteristic of joined appendages.
 - Animals belonging to Phylum Mollusca have strong muscular foot which is used for locomotion.
 - Class Reptilia belonging to subphylum vertebrata show weak legs.
 - Class Aves belonging to subphylum vertebrata have wings which are modified into fore-limbs.
- 2) Plant tissue culture is widely employed in developing clones of plants through the process of micro-propagation. Several process involved in the plant tissue culture is as follows: 1) Selection of explants. 2) Primary treatment. 3) Multiplication/Reproduction. 4) Shooting and rooting. 5) Primary hardening. 6) Secondary hardening. 7) Development into independent plantlet.

