

Science

Chapter No. 2

Cell Division

Short Question Answers:

Q1. What is gene?

Ans: The basic physical and functional unit of heredity is called gene.

Q2. Define heredity.

Ans: The transmission of characters from parents to offspring is called heredity.

Q3. What are haploid cell?

Ans: During meiosis, the number of chromosomes is reduced to half in the daughter cell such cell called haploid.

Long Question Answers:

Q1. Describe mitosis.

Ans: Mitosis is a process by which the parent cell divides into two daughter cells with same number of chromosomes as in the parent cell. Before mitosis (during interphase), two sets of chromosomes are formed. During mitosis the nucleus of parent cell divides and each set of chromosomes is distributed in each daughter nucleus.

After nuclear division a shallow groove arises in the middle of the cytoplasm which deepens further and divides the cell into two daughter cells each having a nucleus.

Q2. Describe meiosis.

Ans: Meiosis is a process by which the nucleus of a cell divides twice to form four daughter cells in such a way that the number of chromosomes in each daughter cell is reduced to half as compared to that in the parent cell.

The process of meiosis consists of two division, meiotic-I division and meiotic-II division. During meiotic-I division, the number of chromosomes is reduced to half as compared to the parent cell. Meiotic-II division is similar to mitosis.

Q3. Define heredity and describe its importance in transferring of characteristics from parents to offspring.

Ans: The transmission of characteristics from parents to offspring is called heredity. The characteristics such as the colour of eyes, skin colour, hair colour, free or attached earlobes, height, intelligence, etc., are the example of the characteristics that are transmitted from parents to the offspring and are called hereditary characteristics.



Q4. Describe the characteristics that can be transferred from parents to offspring.

Ans: The transmission of characteristics from parents to offspring is called heredity. The characteristics such as the colour of eyes, skin colour, hair colour, free or attached earlobes, height, and intelligence.

Q5. Encircle the correct Options:

(i) b (ii) b (iii) c (iv) c (v) c (vi) b

Chapter No. 3

Biotechnology

Short Question Answers:

Q1. What is biotechnology?

Ans: Application of knowledge in the areas like engineering and medicines, etc., is called technology. The technology in which living things are used in different ways to help and benefit human beings is called biotechnology.

Q2. What is genetic testing?

Ans: Genetic testing is one of the latest biotechnological techniques used for genetic diagnosis of inherited diseases. It involves the direct examination of DNA Molecule. It is also used to determine a child's paternity or a person's ancestry.

Q3. Name at least two lifesaving product of biotechnology?

Ans: Vaccine and insulin

Long Question Answers:

Q1. Describe the application of biotechnology in agriculture.

Ans: Biotechnology has played a revolutionary role in improving our agriculture and production of high yields of crops. Herbicides (weed killing chemicals) and pesticides (insect killing chemicals) are used to eliminate the crop enemies (weeds and insects). Such chemicals also cause damage to the crop plants. Using biotechnology, scientists insert weed resistant and pest resistant genes into the plants. Such genetically modified plants produce proteins which are harmful for weeds and pest/insects. Cultivation of such genetically modified crops improves the quality of the crops and makes them safe for human use. The major crops that have been modified are maize (corn), wheat, rice, canola, potato, soybean, cotton, etc.

Q2. What is genetic modification? How is it helpful in increasing the amounts of different nutrients in food?

Ans: The change in the genes of organisms using biotechnology techniques is called genetic modification. The change in the genes of an organism can be produced by removal, addition or repair of genes. It is the modern method to



change the characters of organisms. For example: this process is used in crops to produce resistance in plants against disease-causing microorganisms. Similarly, the improvement in the nutritional quality of edible plants is also one of the advancements of genetic modification. The organism whose genes are modified is called Genetically Modified Organism (GMO). Genetically modified organisms are also used to prepare useful and lifesaving products such as insulin and vaccines, etc.

Q3. Describe the application of biotechnology in health and environment.

Ans: Environmental problems, like pollution, degradation of land and sewage water, etc., are also resolved using biotechnology. Microorganisms, e.g., genetically modified bacteria are used to treat sewage and refuse. They may also be used to clear spilled oil. Microbes which are used as bio-pesticides, bio-fertilizers, biosensors, etc., are being developed using biotechnology techniques.

Chapter No. 4

Pollutants and Their Effects on Environment

Short Question Answers:

Q1. What are the main air pollutants?

Ans: The poisonous and harmful substances which contaminate or pollute the air environment are called air pollutants.

Q2. Name greenhouse gases.

Ans: Carbon dioxide, methane, oxides of nitrogen, these gases are called green house gases.

Q3. Name the acids which are present in the acid rain?

Ans: Sulphuric acid and nitric acid. These acids make the rain water acidic.

Q4. Ozone layer is important. Why?

Ans: Ozone layer stops the ultraviolet rays coming from the Sun to the Earth. Living things on the Earth remain safe from harmful effects.

Q5. 3R strategies stand for what?

Ans: The 3R strategies, i.e., Reduce-Reuse-Recycle can be adopted for conservation of natural resources.

Q6. Write down the names of three such products which can be recycled?

Ans: Plastic, glass and Mettles.

Long Question Answers:

Q1. Describe the adverse effects of carbon monoxide on human organ system?

Ans: Carbon monoxide is a colourless, odourless and poisonous gas. It affect the human organ system badly and causes headache, brain damage and respiratory problems. When carbon monoxide reaches our blood, it gets bonded



with haemoglobin and reduces its oxygen- carrying capacity.

Q2. Point out the sources of air pollutants you find in your locality and suggest ways to reduce the pollution produced from these sources.

Ans: Resources which reduce the pollution:

- Domestic trash and other solid wastes should not be dumped on open places.
- Instead of personal car, public transport should be used for travel.
- Sulphur and lead free fuel should be used in vehicles.
- Factories and industries should be shifted away from the urban areas.
- Acidic industrial exhaust gases must be neutralized before releasing into the air.
- Engines of the vehicles should be tuned properly.
- CFC free products should be used.
- Deforestation should be avoided.

Q3. What is deforestation? Explain its effect on a wild life?

Ans: All non-cultivated plants and non-domesticated animals of an area collectively called wildlife. Deforestation destroys the habitats of wildlife. The extinction risk of wildlife is increased while the natural balance maintained by the wildlife is disturbed.

Q4. What types of climatic changes can appear by deforestation?

Ans: Deforestation has many adverse effects on the environment. It changes weather and climate. Roots of trees hold the soil. Cutting of trees leads to soil erosion and fertile part of the soil is lost through this process. When forests are cut, rate of evaporation is reduced which results in less rain. Deforestation decreases the carbon dioxide consumption by plants increasing its amount in the environment. This leads to the increased greenhouse effect and global warming.

Q5. Suggest ways for proper management of solid wastes?

Ans: Solid wastes include plastic and glass items, Styrofoam, sewage sludge, agricultural wastes, and domestic trash, etc. These wastes pollute the Earth's environment when dumped on open places or burnt. Hence, we should not dump them on open places nor burn them. They should be managed properly. Landfill, incineration and recycling are the common methods of solid waste management.

Landfill: In this method solid wastes are buried in properly designed landfills.

Incineration: In this method wastes are burned at extremely high temperatures.

Recycling: In this method, plastic items (like plastic bottles and polythene bags), glass pieces, aluminium and steel cans, copper wires, etc., are collected separately cleaned, melted and moulded into new products.



Q6. Recycling is good practice to conserve natural resources. Explain?

Ans: In this method, plastic items (like plastic bottles and polythene bags), glass pieces, aluminium and steel cans, copper wires, etc., are collected separately cleaned, melted and moulded into new products. In this way they are used again and again to reduce pollution.

Chapter No. 7 Force and Pressure

Short Question Answers:

Q1. Give the commonly used units of force.

Ans: Newton, it is denoted by N.

Q2. Give the commonly used units of area.

Ans: The used units of area is m^2 .

Q3. Give the commonly used units of pressure.

Ans: The used units of pressure is Pascal (Pa) (Nm^{-2})

Q4. State Pascal's law?

Ans: Pascal's law: The SI unit of pressure (Nm^{-2}) is called Pascal which is denoted by Pa.

Long Question Answers:

Q1. Describe an application of Pascal's law.

Ans: Hydraulic system called hydraulic jack. Hydraulic jack a small, force F, is applied on a small piston which produces pressure P on the oil. Pressure P is transmitted through the pipe to a very large cylinder fitted with a piston. Since area of this piston is very huge. So, a very large force is produced by pressure P at this bigger piston which may be used to lift something very heavy such as a car.

Q2. Describe the use of a pneumatic system in daily life.

Ans: Some common applications of compressed air are mentioned below:

- i. Automobile tyres are inflated with compressed air.
- ii. Spray guns use compressed air for spraying paint.
- iii. Compressed air is used to operate air-powered (pneumatic) tool like hammers, drills, etc.
- iv. The compressed air is also used in air brake system in heavy vehicles.

Chapter No. 8 Measurement of Physical Quantities

Short Question Answers:

Q1. Define physical quantity.

Ans: The quantity that can be measured is called a physical quantity.

Q2. Define the term prefix.

Ans: Prefix are based on multiplying and dividing the units by powers of 10. The



words or letters added before SI units such as milli (m), centi (c) and kilo (k) are known as prefixes.

Q3. What is metre rule?

Ans: Metre rule, measuring tape, etc. are the instruments which are used for the measurement of length.

Long Question Answers:**Q1. What are SI units? Explain.**

Ans: In 1960, the eleventh general conference of International Committee on weights and Measures recommended that all countries of the world should adopt a system of same kind of standard units. This conference recommended the use of International System of units. It is abbreviated as SI. A practical unit of volume is litre (L). Mostly the litre is used for measuring volume of liquids such as milk, petrol, cooking oil, etc. it is $1/1000^{\text{th}}$ part of a cubic metre (m^3).

Therefore $1\text{m}^3 = 1000\text{L}$

Also $1\text{L} = 1000 \text{ milli litre} = 1000 \text{ cubic centimeter (cc)}$

Q2. Describe the importance of SI units.

Ans: Various standard units have been in use at different times in different parts of the world. With the passage of time, these units were made more precise and acceptable. People especially business communities and scientists of different countries faced problems of converting the units into one another. This problem was solved in a conference of the scientists from all over the world held in Paris.

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Q3. Describe the use of measuring cylinder.

Ans: A measuring cylinder is used to measure the volume of a liquid. It is made of glass or transparent plastic. It has a scale in millilitre (mL) or cubic centimeter (cm^3) along its length. That is why, it is also called graduated cylinder. Measuring cylinders of different capacities (from 100mL to 2500mL) are available in the school laboratory. To measure the correct volume of a liquid, cylinder must be placed on horizontal surface and the eye should be kept on the level with the bottom of the meniscus (curved surface).

Q3. Write short notes on measuring flask and pipette.

Ans: Flasks are laboratory vessels (containers). They are made of glass or plastic. Their sizes are specified by the volume they can hold. These are usually available in the sizes of 50 mL, 100 mL, 250 mL, 500 mL and 1000 mL. These are graduated



in the units of cubic centimeter (cc) or millilitres (mL). Flasks are used for making solutions.

Note: Science work given above will be done on Science school copy.
(learn also)

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