

Maharashtra Board Class 10 Science and Technology Part II

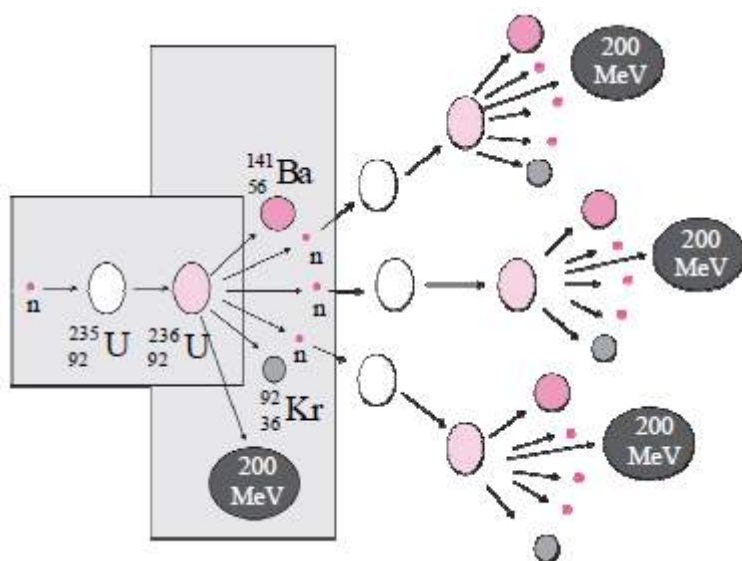
Solved Previous Year Questions-2019

1. (A) Solve the following questions.

[5]

i. Identify the process shown in figure and name it.

(1)



Answer: This process is known as Nuclear Fission (Chain Reaction)

ii. Pranav and Pritee are twins in your class. They belong to _____ twins type. (1)

Answer: dizygotic

Occasionally, two oocytes are released from the ovary of a woman and both oocytes are fertilized by two separate sperms and thus two zygotes are formed. Two embryos are formed from those two zygotes and both of those embryos are separately implanted in the uterus and thus, dizygotic twins are delivered after complete development. Such twins are genetically different and may be of the same or different by gender.

iii. There is an oil layer on the water surface of the river in your area. What will you do? (1)

Answer: Hydrocarbonoclastic bacteria (HCB) like *Pseudomonas* spp. and *Alcanovorax borkumensis* are used to clear the oil spills, as they have the ability to destroy the pyridines

and other chemicals.

iv. Fill in the boxes with the help of the given clue: (1)

Continuous consumption of alcohol and tobacco material _____

A							0	
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Answer:

A	D	D	I	C	T	I	O	N
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v. Find out the correlation: (1)

White revolution: Increase in dairy production:: Green revolution: _____.

Answer: Increased production of food grains or crop yield

Various methods applied for harvesting maximum yield from minimum land are collectively called the green revolution.

(B) Choose the correct alternative and rewrite the statements: [5]

i. Somatic and stem cells undergo _____ type of division.

- (A) Meiosis
- (B) Mitosis
- (C) Budding
- (D) Cloning

Answer: (B) Mitosis

There are two types of cell division as mitosis and meiosis. Mitosis occurs in somatic cells and stem cells of the body, whereas meiosis occurs in germ cells.

ii. Which of the following is a man-made disaster?

- (A) Earthquake
- (B) Flood
- (C) Meteoric
- (D) Leakage of toxic gases

Answer: (D) Leakage of toxic gases

Earthquake, Flood and Meteoric are all natural disasters, while leakage of toxic gases is man-made.

iii. In a food chain, autotrophic plants are present at the _____ level.

(A) Tertiary nutrition
(C) Producer

(B) Secondary nutrition
(D) Apex

Answer: (C) Producer

Autotrophic plants are present at the producer level of the food chain.

iv. _____ is a cold blooded animal.

(A) Bat
(C) Rabbit

(B) Snake
(D) Elephant

Answer: (B) Snake

Reptiles are considered to be cold-blooded animals as they have the ability to maintain their body temperature according to changes in an environment. Snakes are reptiles and hence, are considered to be cold-blooded animals.

v. _____ is a connecting link between annelida and arthropoda.

(A) Duck-billed platypus
(C) Lungfish

(B) Peripatus
(D) Whale

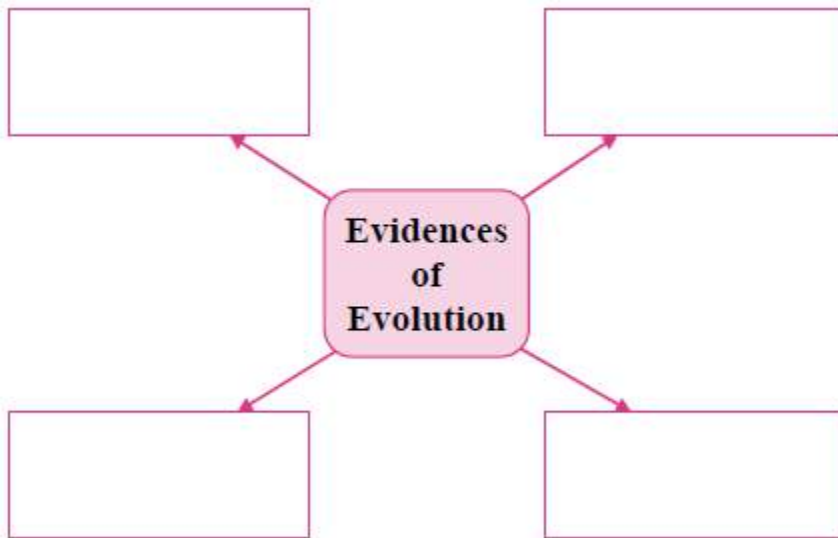
Answer: (B) Peripatus

Some plants and animals show some morphological characters by which they can be related to two different groups; hence, they are called 'connecting links'. Ex. In *Peripatus*, characters like segmented body, thin cuticle, and parapodia-like organs are present. Similarly, these animals show tracheal respiration and open circulatory system similar to arthropods. This indicates that *Peripatus* is connecting link between annelida and arthropoda.

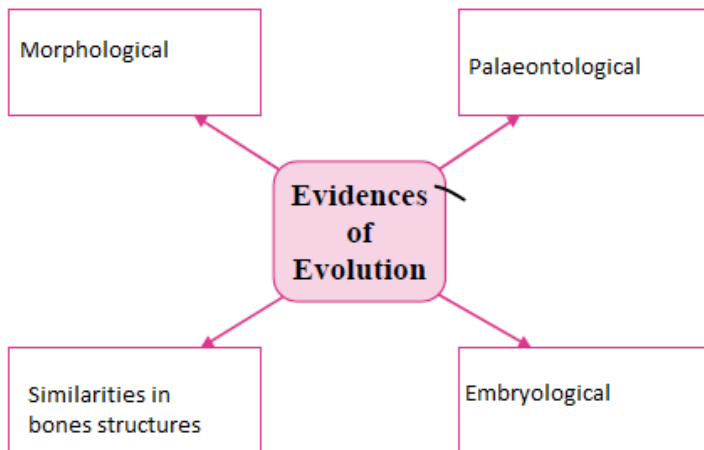
2. Solve any five of the following questions:

[10]

i. Complete the following chart:



Answers:

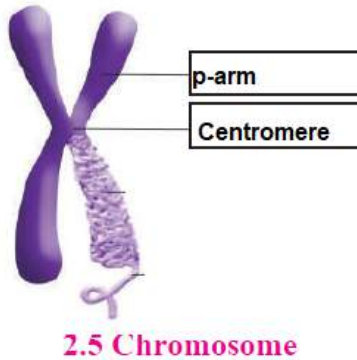


ii. Draw a neat diagram of the structure of chromosome and label the parts:

A. Centromere

B. p-arm.

Answer:



iii. What are the advantages of hydroelectric power generation?

Answer: Given below are the benefits of hydroelectric power generation:

- It is a clean source of energy. Since no fuel is burnt in hydroelectric plants, it results in no air pollution due to combustion of fuel results.
- Since water is used in the generation of energy, if there is sufficient water storage in the Dam, it is possible to generate electricity, as and when necessary.
- Although water reservoir is used for power generation, it can be replenished during the rainy season, leading to uninterrupted power generation.

iv. State any four benefits of animal classification.

Answer: Benefits of animal classification are as given below:

1. The study of animals is made more convenient with animal classification.
2. The study of a few animals from a group helps to understand the entire animal group.
3. Animal classification gives an idea about animal evolution.
4. Animals can be easily identified with great accuracy.
5. It helps to understand the relationship of animals with other living organisms.
6. It helps to understand the habitat of each animal and its exact role in nature.

7. It helps to understand various adaptations shown by animals.

v. State any four objectives of disaster management.

Answer: Given below are the objectives of disaster management:

1. Save human life by evicting the people away from the place of disaster
2. Reduce the effect of disaster by supplying essential commodities to the people
3. To restore human life in the disaster region by creating reconciliation in disaster.
4. Rehabilitate the disaster victims.
5. Considering protective or preventive measures in disaster, so as to reduce the intensity of future disasters.

vi. Give scientific reason:

Microbial enzymes are used instead of chemical catalyst in a chemical industry.

Answer: Instead of chemical catalysts, microbial enzymes are used in the chemical industry. These enzymes are active at low temperature, pH and pressure; due to which energy is saved and erosion-proof instruments are also not necessary. Enzymes carry out specific processes; hence, unnecessary by-products are not formed due to which expenses on purification are minimised. In case of microbial enzymatic reactions, elimination and decomposition of waste material is avoided and enzymes can be reused. Hence, such enzymes are eco-friendly.

vii. Read the following extract and answer the questions that follow:

A liberal view behind the concept of organ and body donation is that after death our body should be useful to other needy persons so that their miserable life would become comfortable. Awareness about these concepts is increasing in our country and people are voluntarily donating their bodies.

Lives of many people can be saved by organ and body donation. Blinds can regain their vision. Life of many people can be rendered comfortable by donation of organs like liver, kidneys, heart, heart valves, skin etc. Similarly, the body can be made available for research in medical studies. Many government and social organizations are working towards increasing the awareness about body donation.

a. What is the liberal view behind organ and body donation?

b. Name any four organs that can be donated.

Answer: a. A liberal view behind the concept of organ and body donation is that after death our body should be useful to other needy persons so that their miserable life would become comfortable.

b. Four organs that can be donated are organs like liver, kidneys, heart, heart valves, skin etc.

3. Solve the following questions (any five):

[15]

i. Answer the following questions:

a. What do you mean by central dogma?

b. What is transcription?

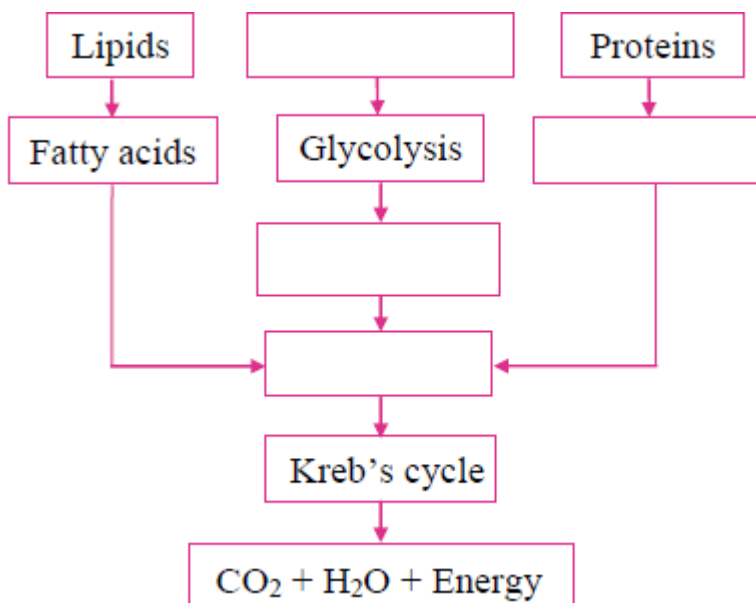
c. What is meant by triplet codon?

Answers: a. Process of synthesizing proteins by DNA through the RNA is called "Central Dogma."

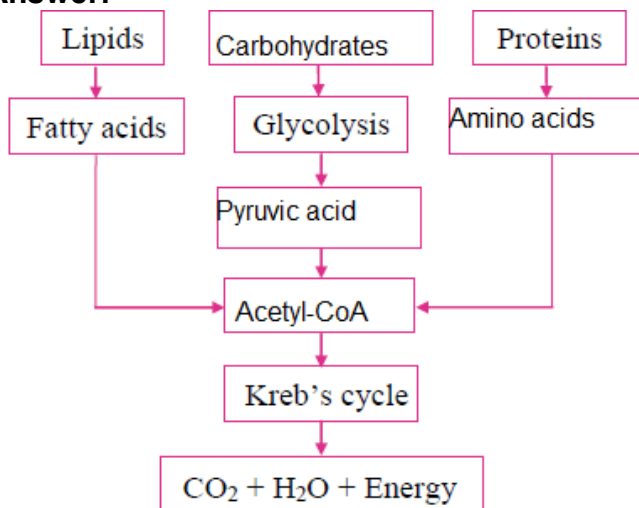
b. mRNA is produced as per the sequence of nucleotides on DNA. Only one of the two strands of DNA is used in this process. The sequence of nucleotides in mRNA being produced is always complementary to the DNA strand used for synthesis. Besides, there is uracil in RNA instead of thymine of DNA. This process of RNA synthesis is called 'transcription'.

c. The mRNA formed in nucleus comes in cytoplasm bringing in the coded message from DNA containing the codes for amino acids. The code for each amino acid consists of three nucleotides called 'triplet codon'.

ii. Complete the following chart and state which process of energy production it represents:



Answer:



iii. a. Playing games on mobile while eating is right or wrong. Justify.



Answer: It is wrong. If you play games on mobile while eating your entire concentration will be on the game and so will not digest the food properly. Hence, you should respect food and concentrate on that while eating, instead of on your mobile.

b. What do you conclude from the following picture?



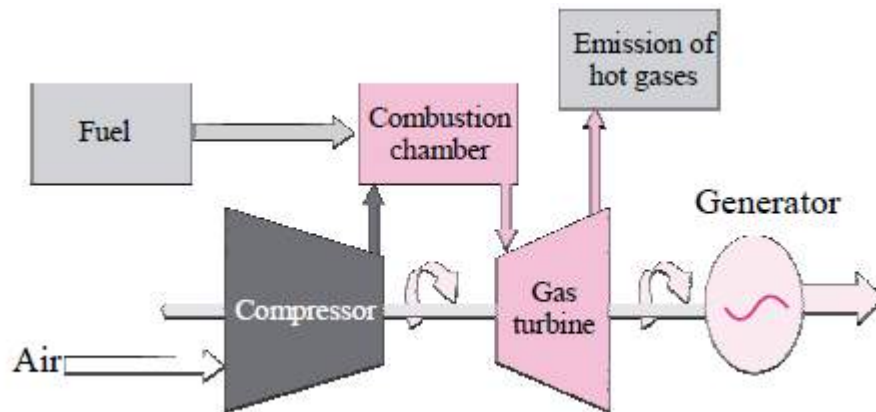
Answer: The image is a message about addiction control. You have to control and stay away from addictions such as smoking, drugs, alcohol and so on.

c. Observe the following picture and state what can be the outcome?



Answer: Taking a selfie on the road could lead to an accident, as concentration would be on taking the photo and not on the vehicles on the road.

iv. Observe the diagram and answer the questions:



- Which energy is generated from the power plant?
- State its source.
- Which is more eco-friendly-Power generation from coal or Power generation from natural gas? Why?

Answer: a. Electricity is the energy generated from the power plant.
b. The source for energy is natural gas.
c. Obviously, power generation from natural gas is more eco-friendly as burning of the natural gas does not produce sulphur dioxide that causes pollution. The efficiency of generating power from natural gas is also pretty high.

- v. Identify my class/phylum and give one example of it:
- I have mammary glands and exoskeleton in the form of hair.
 - We form the highest number of animals on the planet. We have bilateral symmetry and our exoskeleton is in the form of chitin.
 - I live in your small intestine, my body is long and thread-like and pseudocoelomate.

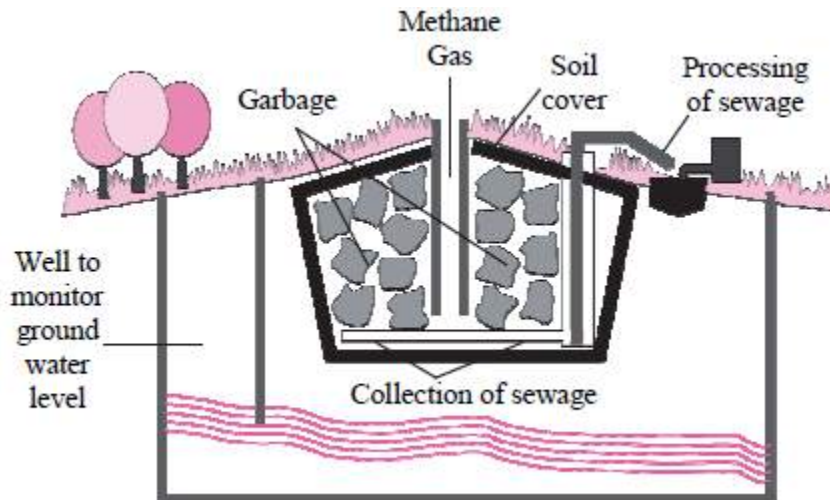
Answer: a. Class- Mammalia
Examples: Elephant, Human, Kangaroo, Dolphin, Bat, etc.

b. Phylum- Arthropoda
Examples: Crab, spider, scorpion, millipede, centipede, cockroach, butterfly, honey bee, etc.

c. Phylum- Aschelminthes

Examples: *Ascaris* (Intestinal worm), Filarial worm, *Loa loa* (Eye worm), etc.

vi. Observe the following figure and answer the questions:



a. Identify the process shown in the figure.

b. Explain the process in short.

Answer: a. The process shown in the figure is known as Modern Landfill site.

b. Degradable waste collected in urban areas is used for this purpose. Large pits are dug in open spaces far away from the residential area and those pits are lined with plastic sheets as a precaution against pollution of soil, due to leaching of toxic and harmful materials. Compressed waste is dumped in the pit. It is covered with layers of soil, saw dust, leafy waste and specific biochemical. Bioreactors are mixed at some places. Microbes present in soil and other top layers decompose the waste. Completely filled pit is sealed with soil slurry. Best quality compost is formed after a few days. Such land filling sites can be reused after removal of compost.

vii. a. What is biotechnology?

b. Explain any two commercial applications of it.

Answer: a. Biotechnology is a field of science that brings about artificial genetic changes and hybridization in organisms for human welfare. Various branches of Science like Cytology, Biochemistry, Molecular Biology, and Genetic Engineering are included in Biotechnology.

b. Two Commercial Applications of Biotechnology are given below:

Crop Biotechnology: Biotechnology is used in the agricultural field to improve yield and variety. Some of the areas where loads of research is being conducted includes Hybrid Seeds, Genetically Modified Crops, Herbicide tolerant plants, Bio fertilizers and so on.

Human Health: Diagnosis and treatment of the diseases are two important aspects of human health management. Biotechnology helps to identify the role of gene, if any, in the disease of a person. Diagnosis of diabetes and heart diseases has become possible even before the onset of symptoms, with the help of biotechnology. Diagnosis of diseases like AIDS, dengue can be done within a few minutes. Hence, treatment can be done at the earliest.

4. Solve any one of the following questions: [5]

i. a. identify the following symbols and state their significance: (2)



(1)



(2)

Answer: (1) Save Water.

Significance: Water is essential. Don't run the tap needlessly and waste water.

(2) Use a bicycle.

Significance: It's a non-polluting environment friendly vehicle.

b. How can biodiversity be conserved? (3)

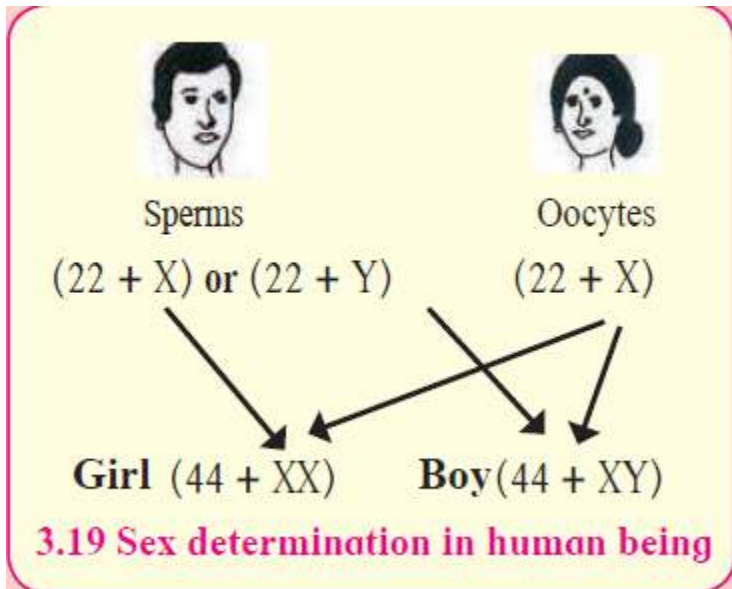
Answer: Given below are some of the points on how biodiversity is being conserved:

1. Rare species of organisms were protected.
2. National parks and sanctuaries were established.
3. Some regions were declared 'bioserves'.
4. Projects were set up for conservation of special species.
5. All plants and animals were conserved.
6. The rules were observed.
7. A record of traditional knowledge was maintained.

ii. Answer the following questions:

a. "Gender of a child is determined by the male partner of couple." Draw a diagram explaining the above statement. (2)

Answer:



The man is totally responsible, whether the couple will have a boy or a girl child. During zygote formation, man contributes either X or Y chromosome to the next generation. But females transfer only X-sex chromosome to the next generation. At the time of fertilization, if X chromosomes come from male, the child will be a girl and if Y-chromosome comes, then the child will be a boy.

b. Prepare a slogan for campaign against female foeticide. (1)

Answer: Beti Bachao, Beti Padhao

c. In the following figure, explain how new fungal colonies of mucor are formed: (1)

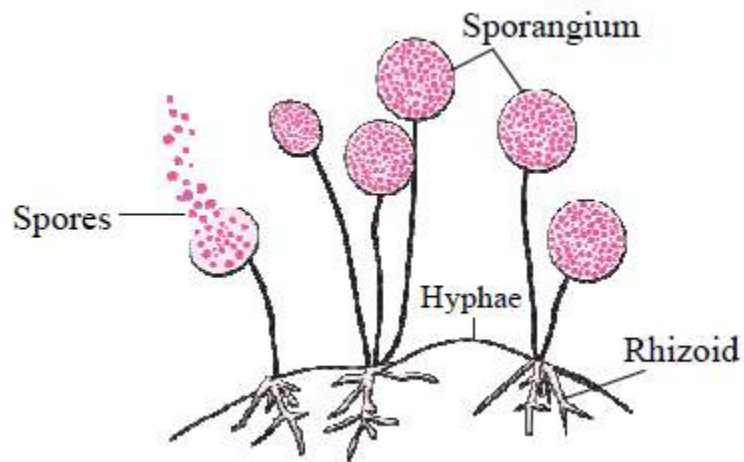


Fig- 1

Answer: Fungi like Mucor has a filamentous body. It has sporangia. Once the spores are formed, sporangia burst and spores are released. Spores germinate in moist and warm places, and a new fungal colony is formed.

d. Identify and state the type of reproduction represented in the above figure (Fig-1) (1)

Answer: Spore Formation is a type of asexual reproduction in Multicellular organisms. The figure given above represents asexual type of reproduction.