01

What adaptations are commonly seen in plant species living in desert biomes?

A) Broad leaves for capturing maximum sunlight

B) Deep root systems for accessing water, waxy coatings to reduce water loss, and small or no leaves to minimise evaporation

C) Shallow root systems and large flowers for attracting pollinators

D) Water-absorbing surfaces and year-round flowering

02

What is the significance of the K-Pg (Cretaceous-Paleogene) boundary in geological history?

A) It marks the beginning of the Mesozoic Era.

B) It marks the end of the Ice Age.

C) It is the geological signature of the mass extinction event that wiped out the dinosaurs and many other species.

D) It marks the first appearance of mammals.

03

What was the impact of the Cambrian Explosion on the evolutionary tree of life?

A) It led to the extinction of nearly all existing species at the time.

B) It resulted in the appearance of most of the major animal phyla seen today.

C) It marked the decline of simple multicellular life forms.

D) It had no significant impact on the variety of life.

04

It has been determined that a glucose molecule with labeled oxygen atoms is used for energy production in the striated muscle cells of a test mouse undergoing intense muscular activity. Based on this, in which of the following compounds would the labeled oxygen atoms from glucose definitely not be found?

A) Lactic acid

B) Pyruvic acid

C) Acetyl Co-A

D) Creatine phosphate

05

What is the primary function of carbohydrates in living organisms?

A) Building muscle

B) Providing a quick source of energy

C) Storing genetic information

D) Regulating body temperature

06

Some characteristics of a plant tissue found in advanced plants are listed below:

• Found at the growth points of the plant.

• Cell walls are thin, and vacuoles are small.

• Contains abundant cytoplasm and large nuclei.

• Maintains its ability to divide throughout the plant's life.

Which of the following could be the plant tissue or cells with these characteristics?

A) Epidermis tissue

B) Primary meristem tissue

C) Vascular cambium

D) Assimilation parenchyma

07

What is the function of the endoplasmic reticulum (ER), and how do its rough and smooth forms differ?

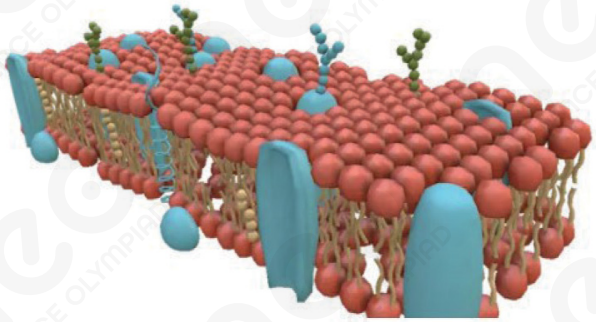
A) Both forms store genetic information; the rough ER produces lipids, and the smooth ER produces proteins.

B) The rough ER has ribosomes and is involved in protein synthesis, while the smooth ER lacks ribosomes and is involved in lipid synthesis and detoxification.

C) The rough ER breaks down waste, and the smooth ER builds cell walls.

D) Both forms are involved in ATP production.

08



Which of the following statements about the cell membrane is incorrect?

A) It has a double layer of mobile phospholipids in its structure.

B) The distribution and number of glycoproteins and glycolipids on its outer surface give the cell its specificity.

C) Fat-soluble vitamins are taken into the cell only with the help of carrier proteins.

D) The hydrophobic parts of the phospholipids are positioned facing each other, while the hydrophilic parts face outward.

09

Which of the following characteristics is not observed in organisms within the plant kingdom?

A) Synthesising starch in organelles that contain chlorophyll pigment

B) Having a contractile vacuole

C) Producing organic matter from inorganic substances

D) Producing inorganic matter from organic substances

10

Which of the following organelles is responsible for breaking down cellular waste in animal cells?

A) Ribosomes

B) Mitochondria

C) Lysosomes

D) Chloroplasts

11

Which of the following statements about the ecological footprint are correct?

I. An increase in fossil fuel usage causes the ecological footprint to grow.

II. Recycling used materials helps reduce the ecological footprint.

III. Countries with increasing luxury consumption also experience a growing ecological footprint.

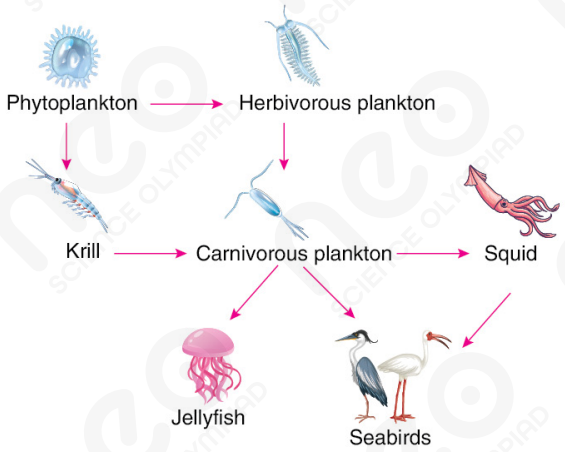
A) I and II

B) II and III

C) I and III

D) I, II, and III

12



The diagram above shows a food web belonging to a marine ecosystem. Which of the following statements about this food web is incorrect?

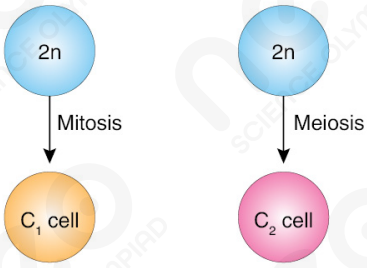
A) The concentration of heavy metal ions that accumulate in living tissues is expected to be highest in seabirds.

B) The food web includes three trophic levels: primary consumers, secondary consumers, and tertiary consumers.

C) Krill and herbivorous plankton are primary consumers.

D) The squid becomes a tertiary consumer when it feeds on carnivorous plankton.

13



Based on these diagrams showing the formation of C_1 and C_2 cells of the same organism, which of the following statements is incorrect?

A) Crossing over does not occur during the formation of the C_1 cell.

B) Two rounds of DNA replication occur during the formation of the C_2 cell.

C) The C_2 cell does not contain pairs of homologous chromosomes.

D) The parent cells that form C_1 and C_2 have the same number of chromosomes.

14

Which of the following statements about neutral fats (triglycerides) are correct?

I. A triglyceride molecule is formed by the esterification of three glycerol and one fatty acid.

II. They cannot pass through the cell membrane without being digested.

III. Humans must obtain the essential fatty acids that are part of triglycerides from food sources.

IV. In various organisms, they are stored as a source of energy and metabolic water when needed.

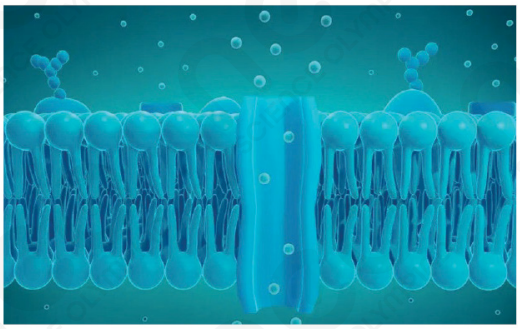
A) I and II

B) II and III

C) III and IV

D) II, III, and IV

15



Which of the following statements about lipids are correct?

I. They play a role in the fluidity of the cell membrane.

II. Triglycerides consist of 1 glycerol and 3 fatty acids.

III. All types of lipids contain nitrogen atoms in their structure.

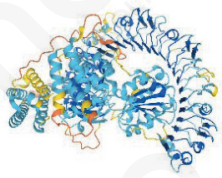
A) I and II

B) I and III

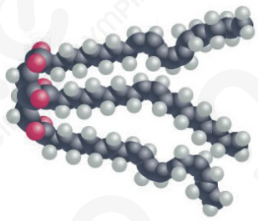
C) II and III

D) I, II, and III

16



Proteins



Lipids

Which of the following are common characteristics of proteins and lipids?

I. Being used as an energy source

II. Being part of the structure of some hormones

III. Serving as building and repairing materials

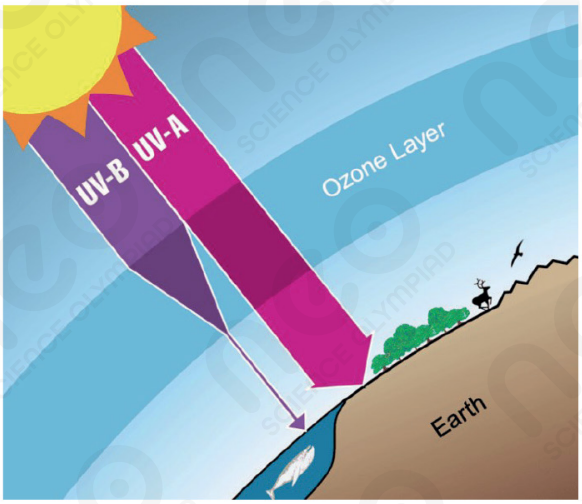
A) I and II

B) I and III

C) II and III

D) I, II, and III

17



The ozone (O_3) layer filters harmful ultraviolet (UV) rays from the sun, preventing them from reaching the atmosphere.

Which of the following outcomes can be observed as a result of the thinning of the ozone layer?

I. Yellowing of plant leaves

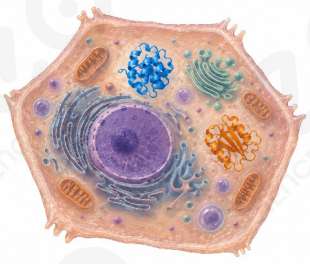
II. Decrease in the number of phytoplankton

III. Increase in the risk of skin cancer in humans

IV. Increase in plant photosynthesis

A) I and II B) II and III C) III and IV D) I, II, and III

18



Two different proteins are functioning in the same human liver cell at the same time.

Which of the following must be the same for both proteins?

I. The number of amino acids they contain
II. The number of peptide bonds they contain
III. The temperature of their shared cellular environment

A) I B) II C) III D) I and II

19

Which of the following is a producer (autotroph) in an ecosystem?

A) A rabbit

B) A mushroom

C) A lion

D) A green plant

20

Which option shows the correct order of energy flow in a simple food chain?

A) Predator → Sun → Plant

B) Plant → Sun → Herbivore

C) Sun → Plant → Herbivore

D) Herbivore → Plant → Sun

21

1. Nymphaea alba

2. Felis chaus

3. Felis nigripes

4. Morus alba

The species names of four organisms are given above. Based on this, which of the following statements are correct?

I. These organisms belong to three different genera.

II. Organisms 1 and 4 belong to the same genus.

III. Organisms 2 and 3 share the same family and order.

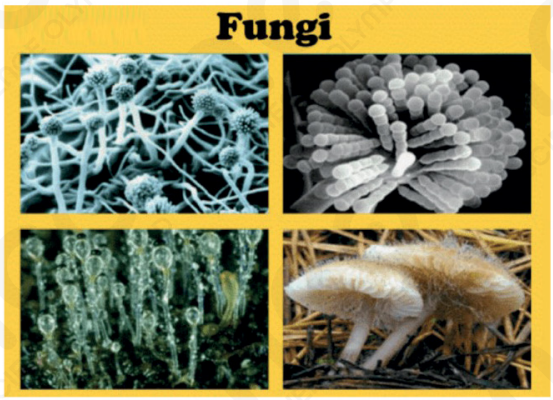
A) I and II

B) I and III

C) II and III

D) I, II, and III

22



Which of the following statements about fungi are incorrect?

I. According to molecular data, fungi show more similarity to animals than to plants.

II. Some species of fungi are used in the production of medicines.

III. Some species of fungi collaborate with plants, helping the plant absorb water and minerals from the soil.

IV. All fungi perform lactic acid fermentation, playing a role in yoghurt production.

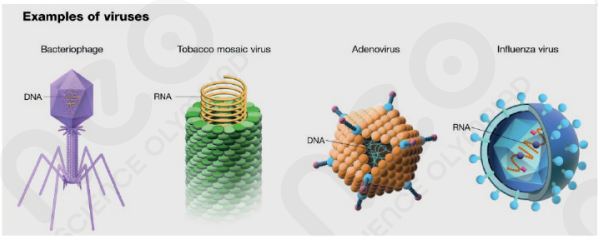
A) IV

B) I and II

C) II and III

D) III and IV

23



Viruses cannot perform metabolic activities, synthesise proteins, or replicate in non-living environments. However, when they enter living cells, they use the cell's enzyme systems and organelles to replicate.

Which of the following characteristics explain why viruses do not function in non-living environments?

I. Frequent mutations due to changing environmental factors

II. The presence of a protective protein coat around their genome

III. Lack of enzymes to carry out these processes

IV. Absence of cellular organelles

A) I and II

B) I and III

C) III and IV

D) II, III, and IV

24

Natural killer cells destroy virus-infected or cancerous cells by releasing a protein called perforin, which breaks down these cells.

Which of the following statements about these cells are correct?

I. They are effective in providing innate immunity.

II. They can distinguish virus-infected or cancerous cells from normal cells.

III. They have a high ability to perform phagocytosis.

IV. They are responsible for antibody production.

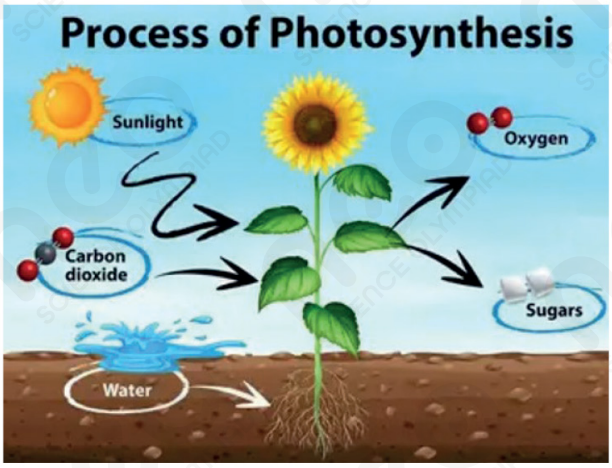
A) I and II

B) II and III

C) I and IV

D) I, II, and III

25



Which of the following statements about photosynthesis reactions in a plant are correct?

I. CO_2 is consumed in reactions known as the Calvin cycle.

II. Reactions that directly use light energy are called light-dependent reactions and occur in the grana.

III. The NADPH molecule is oxidised in the light-dependent phase.

A) I and II

B) II and III

C) I and III

D) I, II, and III

Answer Key

1	B
2	C
3	B
4	D
5	B
6	B
7	B
8	C
9	B
10	C
11	D
12	B
13	B
14	D
15	A
16	D
17	D
18	C
19	D
20	C
21	B
22	A
23	C
24	A
25	A