Case Study Questions

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CLASS: X **BIOLOGY**

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1. Read the following and answer any four questions from 1 (a) to 1 (e).

Long-term muscle use requires the delivery of oxygen and glucose to the muscle fiber to allow aerobic respiration to occur, producing the ATP required for muscle contraction. If the respiratory or circulatory system cannot keep up with demand, then energy will be generated by the much less efficient anaerobic respiration leading to lactic acid accumulation in the muscle tissue. This leads to inducing muscle fatigue. Lactic acid can be broken down in well oxygenated muscle cells and therefore resting removes muscle fatigue.

1-a. One of the following is the organelle which is the site of aerobic respiration:

i. Chloroplast

ii. Mitochondria

iii. Lysosomes

iv. None of these

Ans: ii. Mitochondria

1-b. Anaerobic Respiration is used in one of the following commercial processes:

i. Production of cottage cheese

ii. Production of bread

iii. Production of aerated soft drinks

iv. Production of chips

Ans: ii. Production of bread

1-c. One of the following tissues can undertake anaerobic respiration:

i. Striated muscles

ii. Unstriated muscles

iii. Cardiac muscles

iv. Capillaries

Ans: i. Striated muscles

1-d. Muscle fatigue can be overcome by

i. more exercise.

ii. taking rest.

iii. taking medicine.

iv. running.

Ans: ii. taking rest.

1-e. Study the graph given below and answer the question that follows.

The lactic acid concentration starts rising from

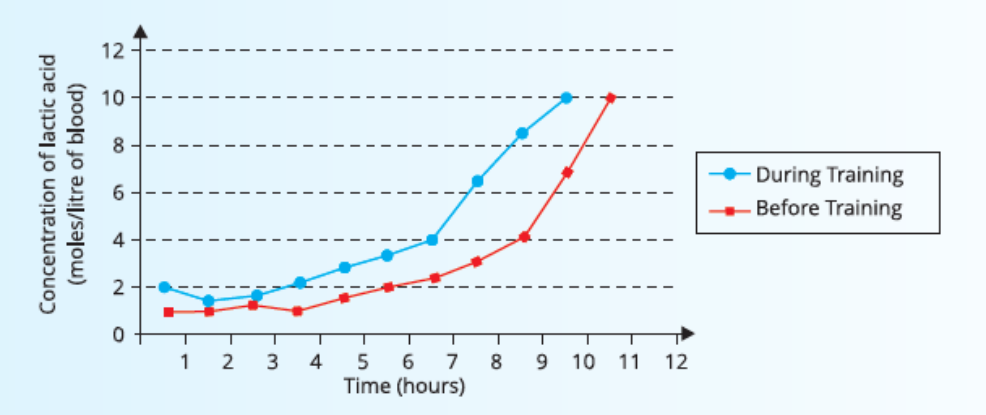
i. 4 hours.

ii. 11 hours.

iii. 5 hours.

iv. 3 hours.

Ans: iv. 3 hours.



2. Read the following and answer any four questions from 2-I to 2-V.

The primary function of the kidney is to make urine and purify the blood. Each kidney removes waste materials and other chemicals which are not required by the body. Purification of blood by removal of waste products is the most important function of the kidney. Creatinine and urea are two important waste products that can easily be measured in the blood. Their "values" in blood tests reflect the function of the kidney. When both the kidneys fail, value of creatinine and urea will be high in blood test.

2-I. Urea is formed from one of the components of food:

a. Proteins
b. Carbohydrates
c. Vitamins
d. Fats

Ans: a. Proteins

2-II. The site of formation of urea is

a. Lungs
b. Kidney
c. liver.

d. large intestine.

Ans: b. Kidney

2-III. Which of the following procedures is used to remove waste from the blood artificially under the conditions of kidney failure?

a. Angioplasty

b. Electrocardiography

c. Hemodialysis

d. Sonography

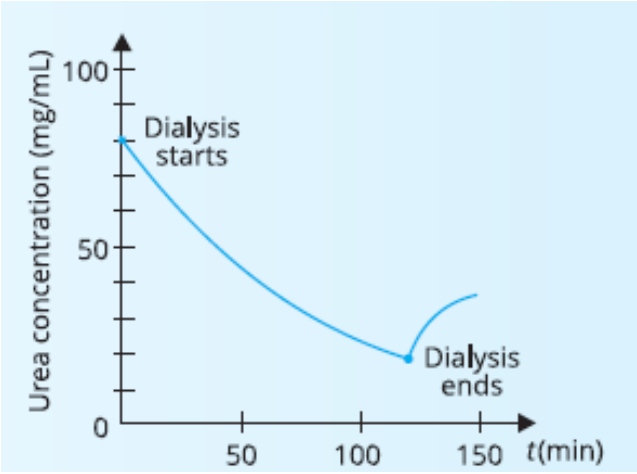
Ans: c. Hemodialysis

1-IV. Kidney damage is frequently seen under one of the following diseases:

a. Dengue
b. Malaria
c. Allergy
d. Diabetes and Hypertension

Ans: d. Diabetes and Hypertension

2-V. Observe the following graph showing concentration of urea during dialysis and answer the questions below.



The level of urea is highest at the

a. middle of dialysis.
b. start of dialysis.
c. end of dialysis.
d. cannot be predicted with this graph.

Ans: b. Start of dialysis.

3. Read the following and answer any four questions from 3-(i) to 3-(v).

Transpiration is the evaporative loss of water by plants. It occurs mainly through the stoma in the leaves. Besides the loss of water vapor in transpiration, the exchange of oxygen and carbon dioxide in the leaf also occurs through pores called stomata. Normally stomata remain open in the daytime and close during the night

(i) Which of the following will not directly affect transpiration?

(a) Temperature

(b) Light

(c) Wind speed

(d) Chlorophyll content of the leaves

Answer: (d) Chlorophyll content of leaves

(ii) Water vapour comes out from the plant leaf through the stomatal opening. Through the same stomatal opening, carbon dioxide diffuses into the plant during photosynthesis.

Reason out the above statements. using one of following options.

(a) The above processes happen only during night time.
(b) One process occurs during day time and the other at night.
(c) Both processes cannot happen Simultaneously.
(d) Both processes can happen together at day time.

Answer: (d) Both processes can happen together at day time.

(iii) Which of the following statements is not true for stomatal apparatus?

(a) Guard cells invariably possess chloroplasts and mitochondria.
(b) Guard cells are always surrounded by subsidiary cells.
(c) Stomata are involved in gaseous exchange.
(d) Inner wall of guard cells are thick.

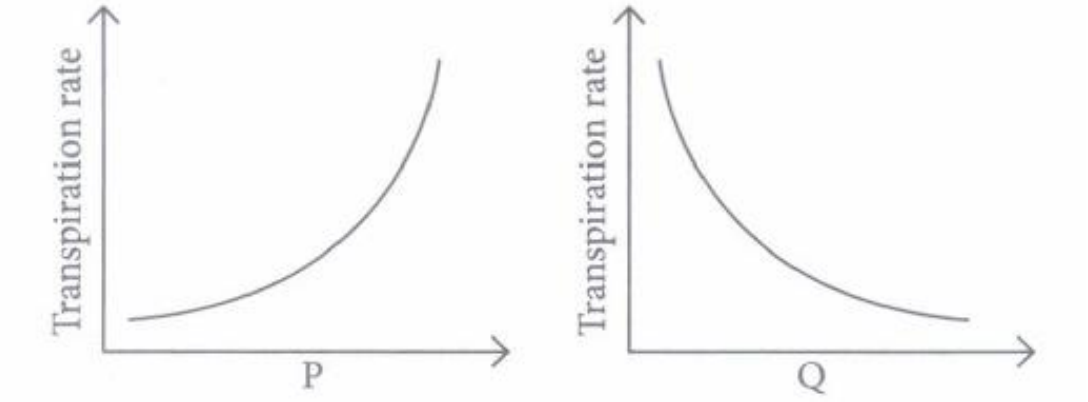
Answer: (b) Guard cells are always surrounded by subsidiary cells.

(iv) Which of the following is not a purpose of transpiration?

(a) Helps in absorption and transport in plants
(b) Prevents loss of water
(c) Maintains shape and structure of plants by keeping the cells turgid
(d) Supplies water for photosynthesis.

Answer: (b) Prevents loss of water.

(v) Refer to the given graphs regarding factors affecting transpiration rate and select the correct option.



(a) P-Atmospheric temperature; Q-Atmospheric pressure
(b) P-Relative humidity; Q-Atmospheric temperature
(c) P-Air movement; Q-Light
(d) P-Atmospheric pressure; Q-Relative humidity.
Answer: (a) P-Atmospheric temperature; Q-Atmospheric pressure

4. Read the following and answer any four questions from 4-(i) to 4-(v).

Heterotrophic nutrition is a mode of nutrition in which organisms obtain readymade organic food from outside sources. The organisms that depend upon outside sources for obtaining organic nutrients are called heterotrophs. Heterotrophic nutrition is of three types: saprophytic, parasitic, and holozoic nutrition.

(i) In which of the following groups of organisms food material is broken outside the body and absorbed?

(a) Mushroom, green plants, Amoeba
(b) Yeast, mushroom, bread mould
(c) Paramecium, Amoeba, Cuscuta
(d) Cuscuta, lice, tapeworm

Answer: (b) Yeast, mushroom, bread mould

(ii) Which of the following is a parasite?

(a) Yeast
(b) Taenia
(c) Amoeba
(d) Earthworm

Answer: (b) Taenia

(iii) Which of the following is an example of saprotroph?

(a) Grass
(b) Mushroom
(c) Amoeba
(d) Paramecium

Answer: (b) Mushroom

(iv) Heterotrophic nutrition involves

(a) production of simple sugar from inorganic compounds
(b) utilisation of chemical energy to prepare food
(c) utilisation of energy obtained by plants
(d) all of these.

Answer: (c) utilisation of energy obtained by plants

(v) In Paramecium, food enters the body through

(a) mouth
(b) pseudopodia
(c) cilia
(d) cytostome

Answer: (d) cytostome

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