
2008

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Part I

Question: 1

1. Mention one significant difference between each of the following: ** [5]
 - a. Anticlinal and Parricidal cell division.
 - b. Ureotelism and Uricotelism
 - c. Tubectomy and Vasectomy
 - d. Photo-oxidation and Photorespiration
 - e. Ontogeny and Phylogeny
2. Explain why: [2½]
 - a. Salt is added in excess to pickles.

Answer:

Salt adds flavor, draws moisture from the exemplar, and retards microbial growth. Salt cures the exemplar. As the limes are cured, the skin starts to turn brown and softer yet firm in about 7 days. If too much salt is added, it breaks down the pectin and the skin may become mushy.

- b. A large percentage of carbon dioxide forms carbonic acid within the RBCs where as very little carbon dioxide forms carbonic acid in the plasma.
- c. The blind spot in the eye is devoid of the ability of vision.

3. State the contribution of each of the following scientists:- [2½]
 - a. Blackman

Answer:

Blackman, Frederick Frost (1866–1947) British plant physiologist Blackman, born in London the son of a doctor, studied medicine at St. Bartholomew's Hospital there, and natural sciences at Cambridge University. He remained in Cambridge for the whole of his career where he served as head of plant physiology until his retirement in 1936.

- b. Charles Darwin

Answer:

Charles Robert Darwin FRS (12 February 1809 – 19 April 1882) was an English naturalist who realised that all species of life have evolved over time from common ancestors, and published compelling supporting evidence of this in his 1859 book "On the Origin of Species" in which he presented his scientific theory that this branching pattern of evolution resulted from a process that he called natural selection.

- c. Hensen



Answer:

Christian Andreas Victor Hensen (February 10, 1835 – April 5, 1924) was a German zoologist. He coined the term plankton and laid the foundation for biological oceanography.

d. T.R.Malthus

Answer:

The Reverend Dr. Thomas Robert Malthus FRS (14 February 1766 – 29 December 1834), was a British scholar, influential in political economy and demography. Malthus popularised the economic theory of rent.

4. Give the exact location and function of the following: [5]

a. Passage cell

Answer:

Endodermis.

b. Grana

Answer:

Chloroplasts

c. Epiglottis

Answer:

Throat

d. Parotid gland

Answer:

Face.

e. Embryo sac

Answer:

Megasporangium.

5. Answer the following: **

a. Mention the site of formation of glyoxylate from glycolate in photorespiration.

b. Which protein binds Ca^{2+} that is released from the sarcoplasmic reticulum?

c. What is Apical Dominance?

d. What is the cause of sickle-celled anemia?

e. Why does blood not clot in the blood vessels?

f. Excess salt is added to pickles

6. Elaborate the following:

a. G-6PD



Answer:

Glucose-6-phosphate dehydrogenase deficiency

b. CT-Scan

Answer:

Computerised tomographic scan

c. VAM

Answer:

Vesicular Arbuscular Mycorrhizae

d. ADH

Answer:

Antidiuretic hormone

e. DPD

Answer:

Diffusion Pressure Deficit

Part II

Section A (Answer any three questions)

Question: 2

1. Give four differences between Meristematic and Permanent tissues.

[3]

Answer:

Meristematic tissue	Permanent tissue
Meristematic tissues are always living and full of protoplasm.	Permanent tissues can be dead.
Meristematic tissues are having ability to divide rapidly and produce new cells	Permanent tissues ; as a rule, do not divide.
Meristematic cells have cell wall made up of thin cellulose only.	Permanent tissues have cell wall of cellulose with depositions of lignin, suberin and cutin .
Permanent tissues are specialized to perform many different functions.	Meristematic tissues; after division; produce permanent tissues only .

2. Enlist four physiological effects of gibberellins.

[3]

3. Define the following:

[4]

a. Water Potential

Answer:

It is the difference in the free energy of water molecules in the solution and that of pure water at the same temperature and pressure. The chemical potential of pure water at normal temperature



and pressure is zero. In solution it is always negative.

b. Osmosis

Answer:

It is defined as the passage of water molecules from a solution of its higher concentration to a solution of its lower concentration through a semi permeable membrane. Thus osmosis refers to the movement of solvent molecules only.

c. Plasmolysis

Answer:

The shrinkage of protoplasm of a plant cell placed in a hypertonic solution, (solution with higher osmotic concentration) is called plasmolysis. This is caused due to exosmosis, as water moves out of the cell.

d. Turgor Pressure

Answer:

Plant cells are always surrounded by rigid cell walls. When these cells are exposed to hypotonic state, water pumps into cell, and the cells get swell, but not enough pressure to break firm cell wall. This water pressure of the cell against the wall is called turgor pressure, and is the desired state for most plant tissues.

Question: 3 **

1. Describe the flow of blood through the heart during different phases of the cardiac cycle. [4]
2. Mention the site of secretion and function of the following [4]
 - a. Prolactin
 - b. Parathormone
 - c. Glucagon
 - d. Testosterone
3. Give two differences between conditioned reflex and simple reflex. [1]

Question: 4

1. Give one function and one deficiency symptom of the following: [4]
 - a. Magnesium
 - b. Zinc
2. Give a schematic representation of the Hatch Slack(C_4)cycle. [4]

Answer:

See topics on 'C₄ Pathway – Hatch - Slack pathway'.

3. Define the following: [2]
 - a. Parthenocarpy

Answer:

Fruits, which develop from unfertilized ovaries, are called parthenocarpy. These are seedless or



contain non-viable seeds, e.g., orange, seedless grapes, cucumber.

b. Root pressure

Answer:

It develops in the xylem vessels as a result of metabolic activities of roots and pushes the water column up through the xylem vessels up to a few feet, e.g., in herbaceous plants but not in big trees or gymnosperms.

Question: 5

1. Draw a labeled diagram of the longitudinal section of the human kidney. ** [4]
2. Describe the salutatory conduction of nerve impulses. ** [4]
3. Briefly describes the events that occur during the luteal phase of the menstrual cycle. [2]

Answer:

See topics on 'luteal phase'.

Question: 6 **

1. Define growth. Give an account of the growth curve in plants. [4]
2. Give four difference between red muscles fibre and white muscles fibre [4]
4. Define : [2]
 - a. Peristalsis
 - b. Multiple fruits

Section B

Question: 7

1. Give an account of the Miller and Urey experiment on the origin of life. [4]

Answer:

The life of this earth never arises accidentally or by any mysterious ways. Rather life arises in a natural ways through physical and chemical processes that led to synthesizes step by step into the complex chemical substances from simpler substance.

As the time passes on, the origin of life was an inevitable phenomenon in the natural environment. In the 20th century the mystery of life was explored to some extent by the untiring efforts of many scientists like famous Russian biochemist A. I. Oparin, outstanding English biologist J.B.S. Haldane, American scientists Stanley Miller and Sydney Fox etc. Their thought and ideas along with their experimental part are now discussed through the theory of chemosynthesis which is also known as Oparin - Haldane theory. This theory explains the origin of life through certain steps.

2. Explain the elongation of giraffe's neck according to the theories of Lamarck and Darwin [4]

Answer:

Philosophic Zoologique. His theory consists of two parts,

- Acquisition of new characters by use and disuse.



- Inheritance of acquired characters

According to this theory, changes in the environment create new changes in living organisms. As a result some parts of the body are used continuously and are modified greatly. Some other parts which are not in continuous use may become weak and gradually become functionless, e.g., vestigial organs.

Due to this differential use and disuse organisms gain or lose certain characters which are called acquired characters. These acquired characters are inherited in successive generations and gradually these variations are accumulated giving rise to new species.

3. Define:

[2]

a. Reproductive Isolation

Answer:

Populations of a species having a discontinuous distribution occupy different geographical areas. They are exposed to different climatic and biological factors. In the absence of gene flow between any two isolated populations of a species, the mutations reach a point at which the two populations become so different that they are no longer able to interbreed. Thus reproductive isolation forms two separate species.

b. Homologous organs

Answer:

Organs of different organisms having similar origin but differ in structure and function, e.g., forelimbs of bat, horse and man.

Question: 8

1. Enlist the basic method of transmission of AIDS.

[4]

Answer:

A virus causes human immunodeficiency virus (HIV). It is not contagious but it spreads through.

- Sexual intercourse.
- Blood transfusion.
- Sharing of needles, syringes among users of intravenous drugs.
- Mother to child through breast feeding and child birth.
- Organ transplantation.

2. Give the disadvantage of pesticides.

[4]

Answer:

Pesticides led to numerous advances in many spheres of human life. However, it is necessary to know what the disadvantages of pesticides are. Pesticides embrace insecticides, herbicides, and fungicides. Pesticides suppress particular species of pests. These pests may comprise insects, rodents, plants, molds, and fungi. In farming, pesticides are applied on fruit and vegetables to raise yields.

3. What is Prosthesis?

[2]

Answer:

A prosthesis is a device designed to replace a missing part of the body or to make a part of the body work better. Diseased or missing eyes, arms, hands, legs, or joints are commonly replaced by prosthetic devices.



Question: 9

1. Difference between Apes and Man with respect to the following characteristics:- [4]
- a. Posture
 - b. Cranium
 - c. Brow ridges
 - d. Locomotion

Answer:

See topics on 'Hominid (Ape-human)'.

2. Give an account of Darwin's finches. [4]

Answer:

See topics on ' Darwin's finches'.

3. Explain : [2]
- a. Coacervates
 - b. Geological Time Scale

Answer:

See topics on 'Coacervate model' and 'Geological time scale'

Question: 10

1. Give a brief account of genetic engineering. [4]

Answer:

See topics on 'genetic engineering'.

2. What are the main objectives of plant breeding? [4]

Answer:

See topics on 'plant breeding'.

3. What is Biotic Potential? [2]

Answer:

See topics on 'Biotic Potential'.

**** Out of syllabus. Answer will be provided up on request**

