

(Sudan 2009)

Answer five questions only of the following:

Question One:

A. Choose the correct answer:

1. Which of the following enzyme present in mouth and pancreas?:
a. trypsin b. amylase c. lactase d. lipase
2. Which of the following compounds formed of 3 carbon as a product from Calvin experiment?:
a. PGAL b. NAD c. NADPH₂ d. ADP
3. From function of hypothalamus is:
a. equilibrium of the body b. regulation of body temperature
c. regulation of sensory impulse d. regulation of reflex action of hearing
4. sequences of amino acids in polypeptide chain:
a. can be determined through spiral form of DNA.
b. determines the sequence of nucleotides in DNA.
c. depends on sequence of nucleotide in DNA.
d. Controlled by DNA ligase enzyme.
5. The following diagram show reproduction in a living organism which depend on alternation of generation of different chromosomal contents one with 2N and the other is N.

Which of the following organism show this phenomenon?
(Man – monocot plants – dicot plants – fern)

6. Chromosome y may be present in
a. Locust eggs b. locust sperm c. bird's egg d. bird's sperm)
7. It is possible to transfer gene of economic importance from certain organism to another one using transporter and biological enzymes, which f the following used in the previous genetic engineering process?
a. Plasmid – polymerase b. virus – ligase enzyme
c. polymerase and genetically modified
d. organism Bacteria and restriction enzyme
8. Bowman's capsule is found in
a. cortex b. medulla c. pelvis of kidney d. loop of henel
9. The rate of blood pressure in blood capillaries and veins equal tommhg.
a.10 b. 80 c. 90 d. 120

B. what is the relation between each couples of the following:

1. Aldosterone and regulation of mineral balances.
2. Pituitary glands and fertilization process.
3. Diameter nerve fiber and rability of nerve impulse

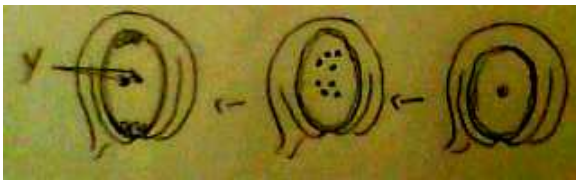
- C. 1. Explain the pulling movement in a tendril of a climbing plant. (Without drawing)
2. Explain with a labeled drawing only the structure of mRNA.

Question two:

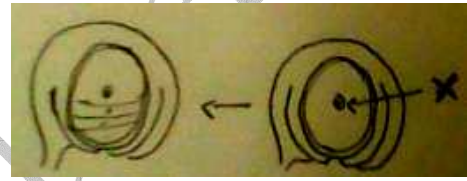
A. write the scientific term for each of the following:

- 1) Cells that have the ability to divide and protect and repair the injured parts of nerve cell.
- 2) Chemical compound reformed in Kreb's cycle.
- 3) Process in which water, mineral salts and glucose returned back to blood.
- 4) Part of the brain to which all sensory impulse except the smell pass through before they reached to the sensory centers in the brain.
- 5) An enzyme its genetic code is found in some viruses where it converts RNA into DNA.
- 6) Fluid containing all components of plasma in addition to large number of WBCs.

B. Study the following drawing then answer:



B



A

- 1) What is the kind of division in both A and B?
 - 2) What is the letter X represent?
 - 3) What is the letter y represent? Then explain the fate of it after fertilization.
- C. 1. Explain on genetic basis the genotype and phenotype of the offsprings resulted from self pollination of turnip plant with oval roots (knowing that one of the parent with circular root and other with long roots) using R for circular roots and T for long roots.
2. **Explain the features of each of the following:**
- a) Insects with double sex.
 - b) Polyploidal plants.

Question three:

A. Rewrite the following statements after correcting the underlined words.

- 1) Vagina is lined with cilia to direct the ova toward uterus.
- 2) Substance produced from combination of hemoglobin and CO₂ is oxyhemoglobin.
- 3) If the individuals resulted from test cross are all dominant this indicated that the tested individual is recessive pure.
- 4) Kidney in higher vertebrates is long and thin and extends along the 2 sides of vertebral column.
- 5) Sertoli cells secrete androgens as testosterone hormone.
- 6) Site of Connection between terminal branch of motor nerve fiber and muscle fiber is called transverse links.

7) The total of all genes (all DNA) in any body cell is called regulatory proteins.

B. Compare between: without drawing

- 1) Structure of pectoral girdle and pelvic girdle.
- 2) Brain membrane and embryonic membrane.

C. Explain with a labeled drawing the device used in experiment to show alcoholic fermentation then mention observation and conclusion.

Question four:

A. Give reasons for:

- 1) Barr body may appear in males and disappear from females.
- 2) Chromosome X does not follow the arrangement of the rest chromosome.
- 3) Enterokinase plays an indirect role in protein digestion.
- 4) Red blood cells are destroyed in liver.
- 5) Posterior lobe of pituitary gland is called neurohypophysis.

B. Explain the role of each of the following:

- 1) Hess fiber in heart.
- 2) Schwann cells in nerve cell
- 3) Melanin layer in skin of man.
- 4) PCR in application of genetic engraving.

C. Write a brief account about:

- 1) Non histone protein inside the nucleus.
- 2) Water stoma in leaves of green plastids
- 3) Meaning of Sex influenced traits. (Without genetic basis)

Question five:

A. What would happen if:

- 1) Inability of fat glands to secrete its oily secretion during the exit of hair from skin.
- 2) Eggs of star fish are put in some salts agitation.
- 3) Sensory centers in occipital lobe are damaged.
- 4) Accumulation of lactic acid in muscle of man.
- 5) Light is fall on chlorophyll molecule inside green plastid.
- 6) Absence of valves from cavities of some extremities veins.

B. Write the site and function of:

- | | |
|--------------------|-----------------------|
| 1. Lacteal vessels | 2. Pits |
| 3. Anticodon | 4. Synaptic vesicles. |

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C. Marriage of woman with blood group O from man with blood group A they have a child, explain on genetic basis the different phenotype and genotype of blood group of the child.

Question six:

A. Choose from Column (B) what is suitable to Column (A):

Column A	Column B
1) Oxidation of glucose occurs in	a) oxidative phosphorylation
2) pyruvic acid is Converted into lactic acid in muscle	b) one molecule
3) process occurs when energy is released to form ATP from ADP in electron transport chain:	c) cytosol
4) number of FADH ₂ resulted from Kreb's cycle is	d) after combination with electrons of NADH
	e) 2 molecules

B. Explain each of the following:

- 1) Root pressure of desert plants characterized by high osmotic pressure.
- 2) Presence of elastic fibers in arteries.
- 3) Swallowing is an organized reflex action.
- 4) Explain with labeled drawing only steps of pollen grain germination.

C. What is meant by:

- a) Beta cells
- b) Heterozygous individual
- c) Casparian strip.

With my best wishes
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