



Grade 12 Students

@ETHIO_ENTRANCEG12

EDUCATIONAL ASSESSMENT AND EXAMINATIONS SERVICE (EAES)
ETHIOPIAN SECONDARY SCHOOL PILOT TEST (ESSPT)
GINBOT 2016 E.C/MAY 2024 G.C

SUBJECT CODE: 06

BOOKLET CODE: 025

Number of Item: 100

Time Allowed: 2: 30 hours

1. Suppose unknown food sample is added to a test tube containing 2cm^3 of distilled water and shaken. Then, following the addition of dilute sodium hydroxide and a few drops of copper sulfate consecutively, purple color is observed. This indicates that the unknown food sample is
 - A. protein.
 - B. carbohydrate.
 - C. fat.
 - D. vitamin.
2. In which part of the digestive system completion of food digestion and absorption mainly occur?
 - A. Mouth
 - B. Stomach
 - C. Small intestine
 - D. Large intestine
3. Which of the following is correct about digestion in the stomach? It is the place where
 - A. digestion of starch begins.
 - B. most bacteria are killed by its alkaline production.
 - C. protein is digested by pepsin enzyme.
 - D. mucus layer is produced to facilitate digestion of the wall.
4. Suppose you are given a loaf of bread for your breakfast and asked to identify where this food digestion starts. You tried to chew the bread mechanically and swallow to be further digested in the lower parts of the digestive organs. This practical feeding experiment will tell you that the bread digestion begins in the
 - A. stomach.
 - B. mouth.
 - C. small intestine.
 - D. large intestine
5. Which one of the following mechanisms occurs during inhalation?
 - A. Contraction of diaphragm muscles
 - B. Formation of higher pressure inside the lung
 - C. Relaxation of external intercostal muscles
 - D. Decrement of overall size of the lung

6. This item is based on the following activities for artificial respiration to save someone's life.

1. Check for breathing
2. Let the chest fall naturally
3. Call for help loudly
4. Open the airways

Based on the above information which activity comes first?

- | | |
|------|------|
| A. 2 | C. 1 |
| B. 3 | D. 4 |

7. A child is breathing over a transparent glass window during rainy time and a few drops from the transparent glass turns the cobalt chloride paper to pink. This colour change implies the presence of what in exhaled air?

- | | |
|-------------------|-----------|
| A. Carbon dioxide | C. Heat |
| B. Water vapor | D. Oxygen |

8. Which of the following is correct about the structure and function of the human heart?

- A. Left atrium contracts and forces the blood to the right ventricle.
- B. Left ventricle is thicker and pumps blood to the lungs.
- C. Right ventricle pumps out the blood to all parts of the body.
- D. Right atrium contracts and forces blood to the right ventricle.

9. Which one of the following blood vessels is correctly matched with its function?

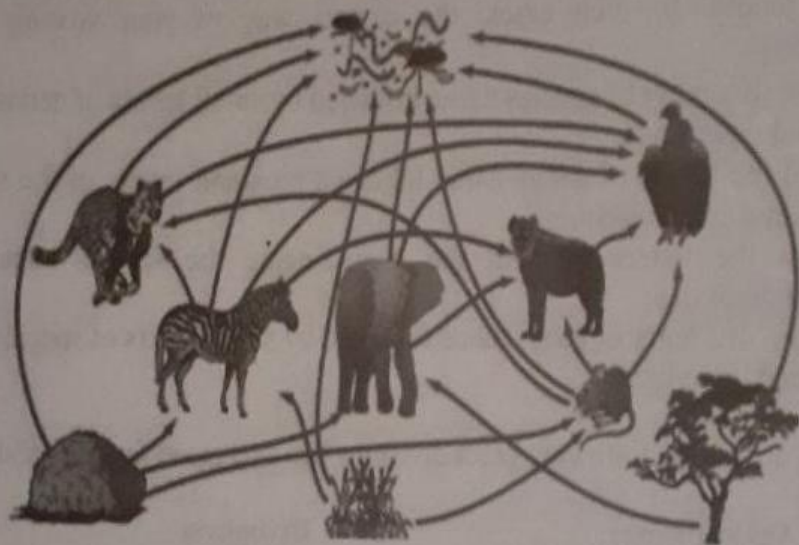
- A. Aorta is the largest artery that carries blood to the lung.
- B. Capillaries are blood vessels where exchange of substances takes place.
- C. Renal artery transports oxygenated blood to the liver.
- D. Pulmonary artery transports oxygenated blood from the lungs.

10. Which of the following is correct about anemia? It

- A. needs too much white blood cells.
- B. is a disease of developing country.
- C. is more observed in boys than girls.
- D. is caused by lack of iron in the diet.

11. Suppose you want to estimate the rate of your heart beat after you are taking some physical exercises. The estimation could be done mostly by placing your finger. Which part of your body to count the number of pulses per minute?
- A. Thigh
B. Heart
C. Side neck
D. Arm pit
12. Suppose your friend is reading about classification in biology subject and you are ready to write the scientific name of an organism when your friend read it loudly. In such cases, the correct way of your writing is by capitalizing
- A. the first letter of species name followed by small letters of genus name and underlining.
B. all the letters of genus name followed by small letters of the species name and underlining.
C. all the letters of both the genus name the species name and underlining.
D. the first letter of genus name followed by small letters of species name and underlining.
13. Which one of the following plant divisions has evergreen features and naked seeds?
- A. Angiospermae
B. Gymnospermae
C. Bryophyta
D. Pteridophyta
14. Suppose you have given spider, sponge, coral and *ascaris* to place in their appropriate phylum. Which one of the given animals should be grouped under phylum nematoda?
- A. *Ascaris*
B. Sponge
C. Coral
D. Spider
15. Suppose grade 12 students are visiting a field to identify vertebrate and invertebrate animals based on the given classification categories. In the field they have observed a number of animals. Which of the following is correctly grouped as invertebrate?
- A. Zebra
B. Eagle
C. Snake
D. Snail

16. Which one of the following alternative is related with abiotic components of an ecosystem? It includes
- predators that affect the survival of their prey.
 - the population of bacteria available in an ecosystem.
 - temperature which affect the survival of living organisms.
 - parasites that affect the survival of their hosts.
17. This item based on the following food web diagram.



Which one of the following is correct about the feeding relationship indicated above?

- Grass is a primary producer.
 - Tiger is a tertiary consumer.
 - Zebra is eaten by a single organism.
 - Elephant is a secondary consumer.
18. In the process of nitrogen cycle,
- denitrifying bacteria convert free nitrogen in the air to nitrates.
 - putrefying bacteria convert nitrates to ammonium compounds.
 - plants use large proportion of free nitrogen in the air than nitrates.
 - animals eat plants so that nitrates pass in food chain as protein.

19. Desert plants have mechanism to cope-with dry condition. Which of the following is the correct adaptation mechanism of cactus to survive in such area? By
- A. possessing tiny and curled leaves
 - B. having a modified spiny leaves
 - C. possessing thick and leathery leaves
 - D. increasing surface area of their leaves
20. One of the following phases is correctly described during meiotic cell division.
- A. Metaphase II – the spindle fiber formed and pairs of chromosomes migrate to opposite pole.
 - B. Anaphase II - the centromeres divide and chromatids move to the opposite ends of the cell.
 - C. Telophase I – nuclear envelopes reform, the chromosomes return to their interphase state and cytokinesis occurs.
 - D. Anaphase I – new spindles are formed and the chromosomes are made of pairs of chromatids.
21. Which of the following is a correct reason why Gregor Mendel selecting garden peas for his experiment? Because garden peas
- A. exhibit many contrasting characteristics.
 - B. mature and ripe in short period of time.
 - C. can be pollinated by wind easily.
 - D. do not show different breeding patterns.
22. Mendel's work on garden peas serves as a foundation for the principles of inheritance. Which one of the following is NOT in line with his principle? A cross between
- A. dwarf and tall stems of plants produced tall stem.
 - B. red and white flowers of plants produced pink flower.
 - C. axial and terminal flowers of plants produced axial flower.
 - D. long and vestigial wings of birds produced long wing.

23. Which one of the following statement is correct about components of DNA?
Its
- A. upright strands are made of deoxyribose sugar and phosphate.
 - B. nitrogen base consists of adenine, uracil, guanine and cytosine.
 - C. base component that pairs with uracil is adenine.
 - D. phosphate group is a unique component that differs it from RNA.
24. Breeding of animals and plants is important to
- A. maintain the weakest possible characteristics.
 - B. minimize and avoids genetic diversity.
 - C. create new and productive genes.
 - D. maintain disease susceptible ones.
25. Which one of the following reproductive health activities is considered as a harmful traditional practice in Ethiopia?
- A. Male circumcision
 - B. Female genital mutilation
 - C. Removal of fallopian tubes
 - D. Cutting of Vas-deferens
26. Which one of the following birth control methods and how they work is paired correctly?
- A. Natural method is based on understanding of the menstrual cycle for intercourse.
 - B. Use of physical barriers like condoms allows the meeting of spermatozoa with ovum.
 - C. An injection of hormone is applied to a woman so that it enhances ovulation for fertilization.
 - D. Use of male condom is hormonal method of birth control by preventing sperm and ovum meeting.
27. Which one of the following statements is correct about plant hormones?
- A. Ethylene stimulates fruits ripening and dropping of leaves.
 - B. Indole-acetic acid inhibits the growth of main shoots.
 - C. Absciscic acid stimulates fruit to ripen and leaves to fall.
 - D. Gibberellic acid inhibits cell division in plants.

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28. Suppose there are two friends (a boy and a girl) who love each other and working together in the same company and made a promise to get married. Through time, one of the partners wants to make a sexual intercourse while the other resists until they get married. Which one is your best advice to keep safe them from the risk of HIV if they contact you? They have to
- make free sexual intercourse.
 - use pills before and after intercourse.
 - use condom to be risk free.
 - abstain themselves before marriage.
29. Plants need water to prepare their own food in their leaves. Initially, the water is absorbed by the root hairs and finally, it reaches to the leaves. The water transport from the root cells up to the leaves could mostly occur by
- active transport system.
 - osmosis from the roots to the leaves.
 - phloem tubes which transports the water from roots to leaves.
 - the presence of low water concentration in the surrounding soil.
30. Suppose you wanted to germinate a bean and maize seeds in a garden using pot 'A' and pot 'B' respectively. You watered the seeds on time and the seeds germinate after a while. Based on this, which one of the following features is correct about germination of these seeds?
- The plumule germinated first in both pots.
 - Hypogeal germination was occurred in pot B.
 - The cotyledons remained inside the soil in pot A.
 - The plumule formed a hook-shaped in pot B.
31. Which one of the following plant species is endemic to Ethiopia?
- | | |
|----------|--------------|
| A. Woira | C. Teff |
| B. Koso | D. Bahir zaf |
32. Which one of the following national parks of Ethiopia and their support to wild animals is correctly paired?
- Mago National Park - Golden Jackals
 - Abijatta-Shalla Lakes National Park - Beisa oryx
 - Bale Mountain National Park - Buffalos
 - Awash National Park - Dik-dik

33. Science as a way of acquiring knowledge which tries to find out exactly why and how natural events happen. This kind of evidence is only be obtained by
- integrations of different assumptions together.
 - gathering various stories and compiling them.
 - carrying out experiments.
 - searching online sources.
34. This item is based on the following steps of scientific method.
- Designing and carrying out an experiment
 - Constructing a testing hypothesis
 - Analysis of results and drawing conclusion.
 - Reporting of scientific findings.
- Which alternative contains the correct order of the above steps starting from the first?
- IV→II→I→III
 - II→I→III→IV
 - I→II→III→IV
 - II→I→IV→III
35. Suppose there are two sterilized flasks (flask 'A' and flask 'B') in which you are going to conduct an experiment. In flask 'A' a piece of meat which was exposed to an environment for an hour was added and the same amount of meat but not exposed to the environment was placed in flask 'B'. The openings of both flasks were covered by cotton and observed every day. Later on worm like organisms were observed in flask 'A' but not in flask 'B'. What is the main conclusion of this experiment?
- Give emphases as living things emerges from nonliving things.
 - The absence of organism in flask "B" is due to shortage of air.
 - The worms in flask 'A' could be due to its exposure to flies before the experiment so that flies eggs hatch into larvae.
 - Since both flasks were originally sterilized, the source of living worm like creatures in flask 'A' is unknown
36. Which one of the following biological tools is used in a field only?
- Syringe
 - Pitfall traps
 - Autoclave
 - Centrifuge

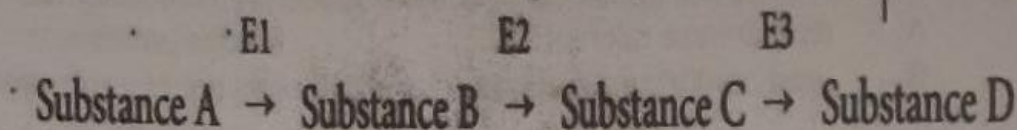
37. Suppose a laboratory technologist took a blood sample from a patient to determine the disease causative agent. The whole blood in the test tube was separated into suspended liquid plasma and solid blood cells settled to bottom. Which one of the following biological instruments is applicable to sort out the liquid and solid components of the blood?
- A. Dissecting kit C. Microscope
B. Petri dish D. Centrifuge
38. Now a days, shortage of food is increasing in Ethiopia. This might be due to population rise; insufficient food production; land degradation or depletion of minerals; poor soil infertility and shortages of foreign currency. Thus, what is the best contribution of biological knowledge to minimize these challenges?
- A. The farmers have to use local fertilizers to enhance fertility of their farm land.
B. The government has to borrow foreign currency to buy and distribute excess fertilizers.
C. Human population has to be minimized by using contraceptive methods without creating awareness.
D. It is impossible to overcome such complex kinds of challenges in developing countries.
39. Which of the following shows the useful aspect of water for living organisms? It serve as a
- A. source of carbon for photosynthesis.
B. byproduct of photosynthesis.
C. reactant in many chemical reactions.
D. raw material for respiration.
40. Water has a unique property that enables some organisms to attach and walk on its surface. This is mainly due to
- A. good transparency. C. high surface tension.
B. high specific heat capacity. D. more viscosity.

41. Which one of the following statements is correct about the main role of carbohydrates? They
- A. are used to release energy in respiration.
 - B. are used to speed up metabolic reactions.
 - C. serve as channel proteins to transport ions.
 - D. serve as thermal insulation and waterproofing.
42. Which one of the following statements is correct about the function of proteins? They
- A. serve as primary source of energy.
 - B. control the metabolism of a cell.
 - C. reduce density of animal and make it more buoyant.
 - D. are used to store chemical energy in plants.
43. Which one of the following statements describes the structure of carbohydrates in living things?
- A. Lactose and galactose are structurally the same sugar.
 - B. All monosaccharaides form straight chain structure when in solution.
 - C. Glucose and fructose are structurally the same in solid form.
 - D. Amylose has a linear α -1, 6- glycosidic side branches.
44. Suppose 3ml of Benedict's solution was added to a test tube that contained a solution of unknown food. Then, the red colour appeared in the test tube after 5 minutes stayed in a water bath. Based on this, the solution of food contained
- A. a reducing sugar.
 - B. fat and oil.
 - C. protein.
 - D. non-reducing sugar.
45. Assume a food solution to be tested is placed in a spotting tray and drops of iodine reagent are added. Finally blue black color appears which confirms that the food solution contains
- A. glucose.
 - B. starch.
 - C. lipids.
 - D. protein.

46. Which one of the following statements is correct about enzymes? They are
A. temperature tolerant. C. fibrous proteins.
B. used up during a reaction. D. specific to a substrate.
47. Which one of the following statements is correct about the role of enzymes in industries and local products? They are used to
A. maintains hairs on animal hides in leather sector.
B. produce lactose-free milk in dairy industries.
C. test for glucose in the urine using amylase.
D. increases the time consumption in industrial products.
48. Which one of the following statements is correct about enzymatic action?
A. Shape of the substrate has to fit with the active site of enzyme.
B. The substrate fits with the non-active sites of enzyme.
C. Enzymes and substrates fit to give enzyme-substrate complex.
D. Enzymes can act by its active site on any form of substrate.
49. An active enzyme needs either coenzymes or mineral ions for their efficient functioning. Then, which one of the following is correct?
A. Apo-enzyme act with coenzyme forming holoenzyme that binds with substrate.
B. If one of the apo-enzyme or coenzyme is missed, the activity to bind with the substrate increases.
C. The catalytic activity slows down when the coenzyme binds with apo-enzyme.
D. There is no interaction among apo-enzyme and coenzyme to give effective catalytic activity.

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50. This item is based on series of metabolic pathway indicated below.



Suppose the concentration of substance 'D' in the cell increases, which one of the following is **INCORRECT** about this pathway?

- A. Product 'D' acts as non-competitive inhibitor to E1 in the pathway.
 - B. E3 activates the rate conversion of substance 'A' into intermediates.
 - C. Substance 'D' negatively inhibits the rate conversion of substance 'A' into intermediates.
 - D. Product 'D' acts as allosteric activator to the activity of E1.
51. Suppose different substrate concentrations will be given for you to see the effect of an enzymatic action. If you add the same amount of enzyme on the substrates molecules in different containers gradually, which one of the following is correct?
- A. Increasing substrate concentration will produces less enzyme-substrate complex.
 - B. Decreasing enzyme concentration will increase enzymatic collision.
 - C. Addition of more substrate beyond saturation point will produce more enzyme-substrate complex.
 - D. Addition of small substrate molecule decreases enzyme- substrate complex formation.
52. Suppose you are provided different factors affecting enzyme activity. Then, which one of the following is correct about those factors?
- A. Low temperature cause fewer collisions and forms fewer enzyme-substrate complex.
 - B. The amount of substrate and enzyme has no effect on an enzymatic activity.
 - C. Irreversible inhibitors temporarily alter the structure of enzymes and its activity.
 - D. Competitive reversible inhibitor permanently alters enzymes conformation.

53. Which of the following is **NOT** in line with the current cell theory?
- A. Cells contain hereditary information.
 - B. All known living things are made up of cells.
 - C. There is spontaneous generation of cells.
 - D. Metabolism and biochemistry of life occurs within cells.
54. There are a number of controversies for origin of life on earth. Currently, many biologists believe that all cells come from
- A. non-living things through spontaneous generation.
 - B. a sphere-like structure of spore from heavenly bodies.
 - C. lifeless objects which resembles both animal and plant cells.
 - D. pre-existing cells through cell division to transfer hereditary material.
55. Which one of the following comparisons is correct about prokaryotic and eukaryotic cells?
- A. Prokaryotic cells possess complex division of labor as compared to eukaryotic cell.
 - B. Eukaryotic cells have cell wall while prokaryotic cells lack the cell wall.
 - C. Eukaryotes have nuclear envelope whereas prokaryotes lack membrane-bound nucleus.
 - D. Prokaryotic cells have more cellular structure as compared to eukaryotic cells.
56. Which one of the following cellular structure is responsible for packing, modifying and distributing of glycoproteins to their final destination?
- | | |
|-----------------|------------------------|
| A. Mitochondria | C. Reticulum endoplasm |
| B. Ribosome | D. Golgi apparatus |

57. Which one of the following statements correctly explains the difference between Davson-Danielli and fluid mosaic model?
- A. Fluid mosaic model suggested membrane as a 'sandwich' of protein and phospholipid which is later modified by Davson-Danielli model.
 - B. Fluid mosaic model retained the idea of a phospholipid bilayer by rejecting sandwich arrangement of Davson-Danielli.
 - C. In Davson-Danielli model the outer part of the membrane is phospholipid where proteins as the inner filling part.
 - D. Davson-Danielli model includes protein-lined pores within the membrane and retain static nature.
58. Which one of the following mechanisms is correct about a means of substances transport across a cell membrane?
- A. In facilitated diffusion, particles move across the membrane against concentration gradient aided by carrier proteins.
 - B. In osmosis, water moves through partially permeable membrane from low water potential to higher water potential.
 - C. In simple diffusion, some substances travel across a cell membrane against concentration gradient until they reached at equilibrium.
 - D. Some substances need energy to cross the membrane as their concentration in the environment is lower than the cell.
59. Which of the following is correct about the process of osmosis in a plant cell?
- A. If a cell is placed in the hypotonic solution, water flow out of a cell and the cell get turgid.
 - B. In isotonic solution, a cell retains its size due to the absence of inflow or outflow of water.
 - C. An inflow or outflow of water doesn't bring any change on the size of a plant cell.
 - D. The size of plant cell decreases in hypertonic solution due to outflow of water and the cell get flaccid.

60. Which of the following is correct about lipids and proteins in the plasma membrane?
- A. Channel proteins have a channel through which different larger molecules can pass.
 - B. Smaller sized and lipid soluble molecules are transported through the membrane by carrier proteins with the aid of active transport.
 - C. Nonpolar head of phospholipid molecules are hydrophilic and arranged on the outer part of the membrane.
 - D. In between the polar heads of phospholipid bilayer, lipid layer containing proteins are found.
61. Tissue culture and cloning are primarily used in different research institutes of Ethiopia having their own advantage. Then, which one of the following is correct?
- A. Tissue culture is important to have a unique but less productive organism in a given small area.
 - B. Cloning is a technique of producing unique copies of genes from a parent cell.
 - C. Tissue culture involves transfer of tissue fragments to an artificial environment in which they can continue to survive.
 - D. Cloning is mainly applicable in animals whereas tissue culture is exclusively applicable in plants.
62. One of the following is correct about antibiotics, biosensor, and forensic science.
- A. Biosensors have been developed to detect pathogens, herbicides, toxins, proteins, and DNA.
 - B. Forensic science is widely acceptable in extracting metals from less concentrated ores.
 - C. Your paternity case could be better identified phenotypically than using forensic science.
 - D. Antibiotics are ordered by physicians to treat viral infections than fungal diseases.

63. The process that refers to the genetically engineered bacteria metabolically breakdown toxic pollutants into harmless compounds is
- A. Composing and landfill C. Bioremediation
B. Microbiological mining D. Biofuel
64. What is biological warfare? It is the
- A. treatment of human health from disease causing agents using appropriate antibiotics.
B. use of infectious agents or their toxins to kill humans, animals or plants as an act of war.
C. act of killing pathogenic microbes using non-pathogenic ones.
D. event where enzymes produced by microbes modify a toxic substance by altering its structure in biodegradation.
65. Which options contains the lists of all diseases caused by bacteria?
- A. Syphilis, candidiasis, tuberculosis, tetanus
B. Cholera, mumps, measles, leishmaniasis
C. Typhoid fever, flu, giardiasis, tuberculosis
D. Syphilis, tetanus, cholera, typhoid fever
66. Suppose you have given a sample of bacterial specimen in the laboratory to identify whether it is gram positive or gram negative. Then, which of the following observation is correct?
- A. Following gram staining, gram positive loses the primary stain and takes the colour of counter stain.
B. A bacterium with thick layer of cell wall retains the purple colour of crystal violet.
C. Following gram staining, a bacterium with thin layer of cell wall loses the counter stain and retains colour of crystal violet.
D. Decoloration step shows a color change in gram positive but not in gram negative.
67. Which one of the following features best describes archaea? It
- A. possesses true peptidoglycan in its cell wall like eubacteria.
B. is unicellular prokaryotes that lack membrane bounded organelles.
C. is multicellular prokaryotes with membrane bounded organelles.
D. has phospholipid bilayer membrane with linear hydrocarbon chains.

68. Which one of the following statement is correct about the feeding in protozoa?
- A. They all decompose dead matter to obtain their food.
 - B. The food is digested in their small gut after it enters the cell.
 - C. They are autotrophs, hetrotrophs and decomposer in their mode of nutrition.
 - D. Some protozoa like paramicium mainly follows phagocytosis way of feeding mechanism.
69. Which one of the following diseases and their mode of transmission is paired correctly?
- A. Cholera - air born disease
 - B. Salmonellosis - water born disease
 - C. Typhoid fever - food born disease
 - D. Syphilis - vector born disease
70. There are a number of chemical reactions take place in the living organisms to produce energy that later uses to synthesize new organic materials for their survival. Bear in your mind that, how energy transformed when you seat on this examination?
- A. Cell does not transfer energy for such hand on mental activities.
 - B. Widely anabolic process is needed in this situation than catabolic process.
 - C. It is too simple activities that cell do not need to transform energy.
 - D. The stored chemical energy inside the cell is broken down to release energy for use during such activities.
71. What is the reason for carotenoids get the name accessory pigments? Because they
- A. cannot transfer light energy directly to the photosynthetic pathway.
 - B. cannot pass their absorbed energy to the chlorophyll.
 - C. occur only in green algae and green plants.
 - D. occur only in cyanobacteria and rhodophyta.

72. Suppose you have grown a shrubby plant nearby your window and then, you allow some branches enter to your home via the window. After a certain period, the branches that get entered the home show longer, twisted and weaker stems than the outside branches. This mainly due to lack of
- A. adequate water.
 - B. enough sun light.
 - C. sufficient CO_2 .
 - D. available O_2 .
73. Light dependent reaction of photosynthesis differs from light-independent reaction in that it involves
- A. evolution of O_2 through photolysis of water.
 - B. carbon assimilation from ATP and NADPH.
 - C. synthesis of sugar from carbon dioxide.
 - D. regeneration of carbon acceptor molecule using ATP.
74. How does photosynthesis reduce the impact of global warming? By
- A. releasing water in the form of vapor to reduce atmospheric heat.
 - B. increasing the concentration of CO_2 to reduce the amount of solar energy reaches the earth.
 - C. sinking the atmospheric CO_2 to form stable chemical energy.
 - D. reducing much unstable and stable chemical energy of an ecosystem.
75. Which one of the following statements is correct about the process of glycolysis? It
- A. invests two ATP molecules for a net gain of two ATP molecules.
 - B. produces energy which is twice of greater than Krebs cycle.
 - C. occurs in both cytoplasm and mitochondria.
 - D. produces two pyruvate molecules from single glucose molecule in mitochondrial matrix.
76. Which one of the following statements is correct about the electron transport system?
- A. It occurs in the cytosol and major sources of ATP in aerobic organisms.
 - B. It generates energy when electrons transfer through the chain.
 - C. The molecular oxygen oxidized into water to produce ATP.
 - D. Protons translocated from cytoplasm to intermembrane space.

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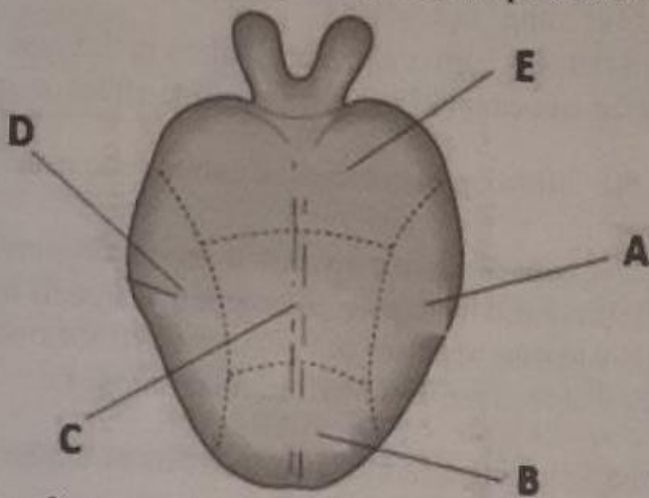
77. How much energy harvested from oxidation of single glucose molecule?
- A total of 2ATP molecules are produced in glycolysis.
 - A total of 2NADH, 6FADH₂, and 2 ATP are produced in Krebs cycle.
 - The highest percentage of energy is harvested from Link reaction.
 - 34 ATP molecules are produced in the electron transport chain.
78. Which of the following are the outcomes when yeasts respire glucose?
- lactate, O_2 and 2ATP
 - O_2 , ethanol and 2ATP
 - CO_2 , H_2O and 4ATP
 - CO_2 , ethanol and 2ATP
79. As it is being evolutionary line, scientific thinking is critical to find evidences about the origin of life. If the creamy worm like maggots on a meat originates from the meat itself implies life originates from the non-living things. This scientific thought belongs to
- spontaneous generation.
 - cosmozoan theory.
 - eternity theory.
 - biochemical theory.
80. Which one of the following statements is the correct comparison of Lamarck and Darwin theory of evolution? According to
- Darwin, variation could be by both inheritances of acquired trait and through trait repetitive use of the structures, but not in Lamarck.
 - Lamarck, continuously used structures will be enlarged unlike that of inheritance trait in the case of Darwin.
 - Darwin, variations could give rise to new characters, but evolution of new character is impossible in the case of Lamarck.
 - Lamarck, inheritance of acquired trait could pass to its offspring, but it develops gradually in case of Darwin.
81. Which one of the following scientific evidences supports modern living things have evolved from a common ancestor? An evidence from
- analogous structures of arm in human and wing in bat.
 - homologous structure of mammalian forelimbs.
 - homologous structure for wings in birds and honey bees.
 - comparative embryology of fishes and larva of beetles.

82. Which one of the following statements is **INCORRECT** about the role of natural selection for evolution?
- Increasing the frequency of advantageous alleles in their gene pool
 - Creating conditions to pass advantageous alleles from parent to offspring
 - Causing to change the genetic composition of some individuals of a population
 - Selecting less adapted individuals from a population and allow to reproduce in a greater numbers
83. Paleontological discoveries of human evolution in Ethiopia determine the
- evolution of human being is from the current existing chimpanzees.
 - fossil of Lucy was significant as it shows bipedalism evolved before large brains.
 - Lucy's pelvis, femur and tibia showed that she was partly herbivore.
 - Lucy fossil was nearest to the 'common ancestor' of humans and chimpanzees than Ardi.
84. Which one of the following different types of mutation and their explanations is paired correctly?
- Inversion - a piece of chromosome is removed and reattached at the same direction.
 - Deletion - one DNA nucleotide being omitted from the sequence.
 - Substitution - an original triplet is replaced by other identical triplet.
 - Addition - an extra sequence of bases in the DNA displayed twice.
85. Assume the frequency of dominant dark fur allele population represented by 'D' is 0.8 and the frequency of recessive white fur allele represented by 'd'. Then, the correct genotype frequency of
- homozygous dominant allele is 0.16.
 - heterozygous recessive allele is 0.32.
 - homozygous recessive allele is 0.04.
 - heterozygous dominant allele is 0.64.

86. Which one of the following statements is correct about the impact of immigration and emigration on speciation?
- Emigration change allelic frequencies when an organism leave and rejoins the previously existing population.
 - Immigration change allelic frequencies when an individual joins the previously existing population.
 - Gene pool remains constant in a population in the case of emigration.
 - Immigration and emigration have a positive effect on speciation.
87. Which one of the following statements is correct about neurotransmitters? They are
- simple nerve cells that make up central nervous system.
 - chemicals produced by endocrine system that signals the body.
 - chemicals that pass impulses from neurons to effectors.
 - hormones that regulate the body's normal functions.
88. Which one of the following reflex actions and their examples is paired correctly?
- Conditioned reflex - blinking of your eye.
 - Simple reflex - bog salivation at sight of food.
 - Conditioned reflex - salivation at your dinner time.
 - Simple reflex - parental attachment formation in humans.
89. This item is based on routes of reflex arc listed below.
Hand on hot plate → temperature and pain receptors in skin → afferent neuron → relay neuron in spinal cord → efferent neuron → muscles of arm → moving hand away from hot object
- Which of the following is correct about this route?
- Putting hand on a hot plate is an effector.
 - Brain is directly involved as co-coordinator in the process.
 - Moving hand away from the hot object is a response.
 - Impulses travel from hot plate to the spinal cord through efferent neuron.

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90. Which of the following belongs to the central nervous system?
- A. Coronalary nerves
B. Spinal cord
C. Spinal nerves
D. Cranial nerves
91. This item is based on the diagram that shows parts of a tongue below.



- A taste site of a tongue to detect more bitter substances is labeled by letter
- A. A.
B. B.
C. E.
D. C.
92. External structure of the eye which limits the amount of light enters into the eye and distributes tears that lubricate eye surface is
- A. eyelashes.
B. eyebrows.
C. eyelids.
D. iris.
93. In the mechanisms of hearing, after the pinna directs of sound waves into the eardrum, the amplified sound waves are transmitted through the ossicles to the oval window. What will be the next event of hearing?
- A. Interpretation of transmitted nerve impulses
B. Vibration of hairs in the ear canal
C. Production of nerve impulses by hair-like sensory cells
D. Vibrations of the fluid in the inner ear

94. Which one of the following structures of human kidney and their functions is paired correctly?
- A. Second coiled tubule - balancing of water.
 - B. Loop of Henlé - diluting of urine.
 - C. Glomerulus - preventing ultrafiltration of blood.
 - D. Collecting duct - reabsorbing of all of the glucose.
95. Which one of the following is **NOT** correct about the functions of different types of hormone?
- A. Adrenocortical hormones affect metabolism of glucose, proteins, and fats.
 - B. Insulin is a hormone that raises the blood glucose level.
 - C. Antidiuretic hormone controls the rate of water excretion into urine.
 - D. Parathyroid hormone controls the calcium levels in the blood stream.
96. Suppose, if you went to a dry desert habitat for a field work, what could your body do to maintain your body temperature at 37°C ?
- A. Shivering
 - B. Vasoconstriction
 - C. Piloerection
 - D. Sweating
97. Suppose you are sick of malaria and got heavy fever with sweat. Which could be your best possible way to compensate the amount of water lost?
- By
- A. feeding salty foods.
 - B. continuous diuresis
 - C. drinking plenty of water
 - D. wearing heavy clothes with fur
98. Now a days, there is fast climatic change globally and locally that enforces the Ethiopian government to plant a number of trees every year. It is believed that deforestation is a major cause of the climate change. As a biologist, what is your conclusion? Deforestation causes such climatic change by
- A. increasing temperature.
 - B. decreasing wind erosion.
 - C. decreasing soil erosion.
 - D. increasing food production.

99. Which of the following is the best way to be safe from the negative impact of climate change?
- A. Promoting a monoculture farming over a smart agriculture
 - B. Replacing the electric consumption with fire woods
 - C. Facilitating expansion of agriculture in the remnant forest
 - D. Creating awareness on environmental conservation
100. Among the following one is the most consequential green legacy initiative launched in Ethiopia in 2019.
- A. Endorsement of Climate Resilient Green Economy strategy
 - B. Preventing endangered species in the Red List of International Union
 - C. Finalizing the Grand Ethiopian Renaissance Dam
 - D. Preventing deforestation using legal constitution

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THE END