

Grade 12 Students

@ETHIO_ENTRANCEG12

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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: 023**
Number of Item: 100 **Time Allowed: 2: 30 hours**

1. What is the purpose of using stains during observation of cells under the microscope? To
   A. easily observe the cells under the microscope
   B. magnify the cells better under the microscope
   C. separately observe cells very close to each other
   D. easily distinguish motile cells from non -motile cells

2. This item is based on the following table which compares plant and animal cells.

No.	Feature	Plant cells	Animal cells
1	Mitochondria	Absent	Present
2	Cell wall	Cellulose	Chitin
3	Nucleus	Rectangular	Central
4	Ribosome	80s	70s

Which row in the above table contains the correct comparison of plant and animal cells?
   A. 1 C. 2
   B. 3 D. 4

3. Which one of the following statements is correct about osmosis? It is the net movement of
   A. water molecules from high water potential to low water potential through a semipermeable membrane.
   B. non-polar molecules from their higher concentration to lower concentration though plasma membrane.
   C. solute molecules from lower concentration to higher concentration through carrier proteins.
   D. amino acids from higher concentration to lower concentration through channel proteins.

4. Which one of the following statements best explains the process of digestion in the stomach?
   A. Bile emulsifies lipid to increase surface area for action lipase enzyme.
   B. Trypsin digests proteins into amino acids under reduced pH condition.
   C. The glycosidic bonds of starch are hydrolyzed by amylase.
   D. Pepsin hydrolyzes proteins under acidic pH condition.

5. Suppose you went to a well-known supermarket to purchase canned fish (tuna). What potential health related labels should you consider before purchasing the food item? You should check the
   A. source from which the fish was caught.
   B. name of the company that canned the fish.
   C. shelf life of the canned fish under the stated condition.
   D. chemical composition of the material used for canning.

6. This item is based on the following functions of the breathing structures.
   1. Secretion of mucus that can prevent the breathing structures from bacteria.
   2. Helps in exchange of carbon dioxide and oxygen between capillaries and the lungs.
   3. Prevents from choking due to entrance of food into the breathing structures.
   4. Maintain the pressure of the chest cavity through the movement of muscles.

   Which one of the above numbers has the functions of the respiratory structures related to the trachea?
   A. 1
   B. 2
   C. 3
   D. 4

7. Which one of the following heart structure and function pairs is correct?
   A. Semilunar valves - prevent the back flow of blood to the heart
   B. Vena cava - returns deoxygenated blood to the left atrium
   C. Bicuspid valve - prevents the back flow of blood to the right atrium
   D. Left ventricle - pumps blood to the pulmonary vein

8. This item is based on the following table that compares the composition of the inhaled and exhaled air.

No	Composition of the inhaled air	Composition of the exhaled air
1	More nitrogen	Less nitrogen
2	Has oxygen	Has no oxygen
3	0.04% carbon dioxide	4% carbon dioxide
4	16% oxygen	25% oxygen

Which row in the above table correctly compares the composition of inhaled and exhaled air?

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

9. Which one of the following statements best describes the role of capillaries in the circulatory system? It
   A. transports deoxygenated blood back to the heart.
   B. is the sites of carbon dioxide and oxygen exchange.
   C. connects big arteries in the body with arterioles.
   D. carry blood away from the heart.

10. A student conducted an experiment to assess the compatibility of unknown blood samples in four separate test tubes labeled, A, B, C and D. Agglutination didn't happen when she mixed blood from the first test tube 'A' with itself and the rest of the test tubes. What would the best conclusion of the student be?
   A. Blood sample A has neither 'antigen A' nor 'antigen B'.
   B. Blood sample A has no anti-A and anti-B antibodies.
   C. Blood samples B, C, and D lack 'antigen A' and 'antigen B'.
   D. Blood samples B, C and D lack anti-A but have anti-B antibodies.

11. Which one of the following descriptions best matches the ultrahigh temperature method for control of microbial growth in a food? It
   A. uses temperature range of 135 ^{O}C to 150 ^{O}C for 2 - 6 seconds.
   B. uses boiling the food at 121 ^{O}C for 15 - 45 minutes.
   C. involves roasting food at 100 ^{O}C for more than 30 minutes.
   D. is heating food at 171 ^{O}C for an hour or 160 ^{O}C for 2 hours.

12. Which one of the following methods is the best for prevention of gastroenteritis?
    A. Taking antibiotics that can kill the causative agent
    B. Using enough amount of oral rehydration solution
    C. Avoid eating undercooked or raw foods of animal origin
    D. Cover the mouse and the nose while sneezing or coughing

13. Which one of the following statements is correct about the causative agent of gonorrhea? It
    A. resides in the mucus areas of the body.
    B. destroys the T- helper cells of the immune system.
    C. can be prevented through vaccination during childhood.
    D. is caused by a spiral shaped bacterial pathogen.

14. How organisms are given scientific names? Based on
    A. similarities in cell's metabolic functions
    B. evolutionary relatedness between organisms
    C. similarities in analogous structures between organisms
    D. the habitats in which the organisms live

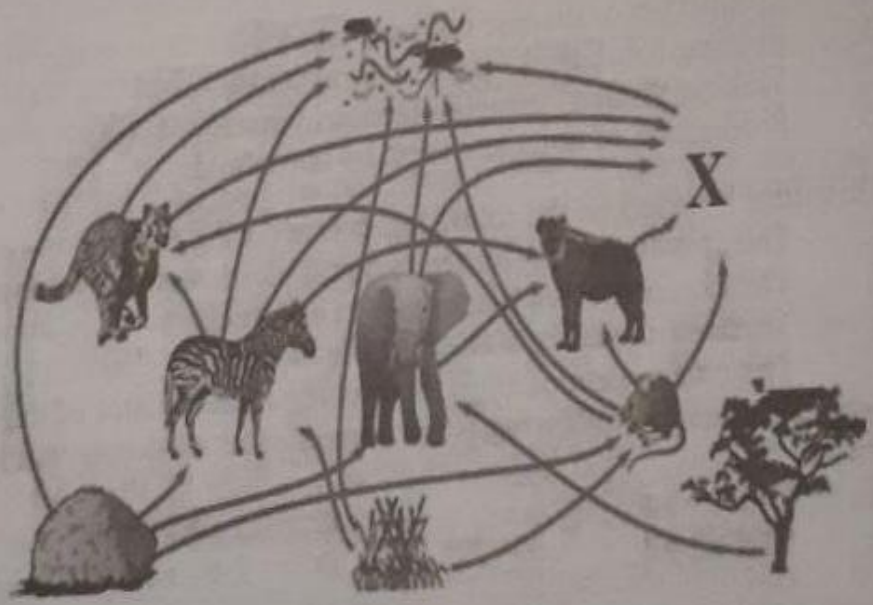
15. Which one of the following statements is the typical feature of division bryophyta? They have
    A. true root system supplied with xylem and phloem.
    B. rhizoids with slender filaments for attachment.
    C. male gametes contained within pollen grains.
    D. small needle-shaped leaves with thick cuticle.

16. Identify the option that contains the correct division of Plantae with its example.
    A. Division Bryophyta → *Funaria*
    B. Division Pteridophyta → *Zea*
    C. Division Angiospermae → *Pinus*
    D. Division Gymnospermae → *Dryopteris*

17. A student made keen observations on some vertebrate animals in order to assign them to one of the classes of vertebrates. Based on his observations, the animals had simple sac-like lungs, their larvae live in water, had moist skin, had external fertilization and were ectothermic. In which class of vertebrates should the student place these animals?

A. Class Reptilia
B. Class Amphibia
C. Class Pisces
D. Class Mammalia

18. This item is based on the following diagram of food web.



In the above diagram, which one of the following statements is correct about the animal represented by the letter 'X'? It

A. obtains the highest amount of energy.
B. acts both as secondary and tertiary consumer.
C. depends on the decomposers as source of energy.
D. is preyed upon by cheetah and hyena.

19. During the nitrogen cycle, which one is the nitrogen fixing soil bacteria?

A. *Klebsiella*
B. *Nitrobacter*
C. *Nitrosomonas*
D. *Pseudomonas*

20. Which one of the following adaptation mechanisms is correctly paired with its example?
   A. Big ears and thin fur - adaptation to dry climate
   B. Large surface area to volume ratio - adaptation to cold environment
   C. Wrinkles in skins - adaptation to arctic environment
   D. Active in early morning and late evening - adaptation to cold environment

21. Which one of the following is the current and modern application of biotechnology?
   A. Production of disease resistant crops
   B. Making local drinks using natural yeasts
   C. Making yoghurt using indigenous yeasts
   D. Production of cottage cheese by households

22. This item is based on the following events during mitosis.
   1. The spindle fibres shorten and pull the chromatids to opposite poles.
   2. The chromosomes become short and thick.
   3. The two nuclei form at each pole of the cell.
   4. The chromosomes align themselves at the equator of the cell.

   Which one of the following is the correct order of events that happen during mitosis?
   A. 1→2→3→4
   B. 1→4→3→2
   C. 2→4→1→3
   D. 2→1→4→3

23. A cross between homozygous red bull and homozygous white cow produces calves with a patchwork apperance of red and white hairs. This type of dominance is
   A. complete dominance.
   B. incomplete dominance.
   C. co-dominance.
   D. over dominance.

24. All of the following are benefits of breeding for a society **EXCEPT**
   A. producing foods in large quantity.
   B. improving the performance of local breeds.
   C. producing disease resistant local varities.
   D. maintaining animals that can survive on very rich food plants.

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25. Which one of the following statements best describes the structure of chromosomes? It is composed of
A. a double stranded DNA molecules coiled around histone proteins.
B. a DNA molecules coiled around molecules of polysaccharides.
C. amino acid molecules and organic bases connected by hydrogen bonds.
D. unsaturated fatty acids and RNA molecules linked by covalent bonds.

26. As compared to mid brain and hind brain, fore brain deals with
A. smell and higher level of thought.
B. orientation and vision.
C. vision and breathing.
D. balance and smell.

27. Which one of the following statements correctly explains the nerve impulse? It is a signal transmitted
A. in either direction along the axons of a nerve cell.
B. through nerve cells due to charge differences.
C. continuously from one nerve cell to the next through wired nerve cells.
D. at a faster rate through nerve cells negatively charged on the outside.

28. Which one of the following statements is correct about the harmful effects of drug abuse? It
A. makes work efficiency better.
B. can briefly lead to short term pleasure.
C. leads to poor muscular coordination.
D. provides instant solutions to difficult problems.

29. What is the cause of long sightedness?
A. Short eye ball
B. Very strong lens
C. Long eye ball
D. Irregular eye shape

30. . What is the function of the Eustachian tube?
A. Lubricating the eardrum
B. Balancing air pressure
C. Transmitting vibration to the oval window
D. Amplifying sound waves in the middle ear

BIOLOGY TRY OUT

31. This item is based on the following list of features that happen during maintenance of balance by the inner ear.

I. Tilting of cupula pressing sensory cells
II. Impulse is transmitted to the brain
III. Movement of the fluid in the semicircular canals in response to body movement
IV. Nerve impulse created in the sensory nerve endings
V. Brain interprets the direction of motion of the body returns it to normal posture

Which one of the following is the correct sequence of events during maintenance of balance by the inner ear?

A. III → II → I → IV → V
B. I → II → III → IV → V
C. III → I → IV → II → V
D. I → II → III → IV → V

32. Identify the gland correctly paired with its function.

A. Thyroid gland - regulates the amount of oxygen uptake by tissues
B. Adrenal gland - removes glucose not used by tissues
C. Gonads - controls breathing and heart rates
D. Pancreases - controls the water content of the blood

33. Which one of the following statements is correct about vasodilation? It is

A. widening of blood vessels that leads to loss of heat through radiation.
B. heat loss mechanisms from the body through erection of hairs on the skin.
C. reduction of blood flow through capillaries to conserve heat loss.
D. reduction of heat loss through accumulation of subcutaneous fat.

34. How does the skin help in salt balance? By

A. removing excess solutes during sweating
B. forming water proof layer around sense organs
C. constricting the capillaries and preventing water loss
D. harboring bacteria that can oxidize minerals

35. Which one of the following animals is present in the Bale Mountain National Park?

A. Oryx
B. Roan Antelope
C. Buffalo
D. Ethiopian wolf

36. Which one of the following is the function of the Bowman's capsule of kidneys?
    A. Formation of concentrated urine
    B. Active reabsorption of glucose into blood
    C. Ultrafiltration of the contents of blood
    D. Reabsorption of water into capillaries

37. Which one of the following is correct about the functions of the internal structures of leaves?
    A. Palisade mesophyll is the main photosynthetic tissue of leaves.
    B. Lower epidermis protects leaves from evaporation of water.
    C. Spongy mesophyll is used for transport of water within leaves.
    D. Vascular bundles transport carbon dioxide to plant tissues.

38. Which one of the following statements is correct about transport of water in plants? Water
    A. moves down its concentration gradient by endocytosis.
    B. moves from soil into root hairs by active transport.
    C. enters neighboring plant cells by osmosis.
    D. enters xylem tissues by facilitated diffusion.

39. A student placed 6 cm long bean seedlings under two sets of conditions. She placed the first group 'X' in light proof box with a hole on one side, and the second group 'Y' in full sunlight. Which one of the following observations would be the correct result of the experiment? The seedlings in the
    A. second group would grow taller.
    B. first group would grow towards the hole.
    C. second group become yellowish in color.
    D. first group produce more starch.

40. Which one of the following statements is correct about phototropism?
    A. The part of the shoot exposed to light grows faster than the part not exposed to light.
    B. Decapitation of the shoot will not affect the responses of seedlings.
    C. IAA diffuses towards the illuminated part reducing growth.
    D. It occurs due to the diffusion of IAA in the shoot in response to light.

41. Which one of the following are Ethiopian endemic plants?
    A. *Gingo biloba, Eragrostis teff, Ficus vasta*
    B. *Erythrina brucei, Ficus vasta, Triticum aestivum*
    C. *Ensete ventricosum, Eragrostis teff, Guizotia abyssinica*
    D. *Triticum aestivum, Ficus vasta, Juniperous procera*

42. What was the reason that using chlorofluorocarbons(CFCs) has been banned and freezers containing these compounds are disposed of very carefully? This is because CFCs can cause
    A. acid rain.
    B. flooding.
    C. ozone layer depletion.
    D. extreme drought.

43. student found several dead flies under a tree, and wanted to conduct an experiment to find the possible reasons for the death of the flies. What should his first step be?
    A. Constructing hypothesis
    B. Designing an experiment
    C. Doing background search
    D. Asking question

44. A patient was diagnosed for a disease transmitted through pathogenic microorganisms. The patient purchased the prescribed drug and completed the dose required for treatment under direct health professional observation. However, he was not cured from the disease. What would be the hypothesis of the health professional as part of planning an experiment regarding the problem?
    A. The patient might have missed his breakfast in the morning.
    B. The patient might have not properly used the prescribed drug.
    C. The patient might have been infected with drug resistant microorganisms.
    D. The patient should have taken the drug through injection.

45. Which of the following are organic molecules?
    A. Glucose and glycine
    B. Iron oxide and amino acids
    C. Methane and Carbon dioxide
    D. Calcium carbonate and linoleic acid

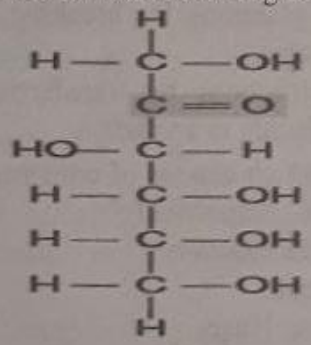
46. This item is based on the following properties of water.

1. Water is used as a raw material in many reactions.
2. Substances around the cell are transported by water.
3. Some insects can easily walk on the surface of water.
4. Sweating is effective in controlling our body temperature.

Which one of the properties of water listed above is related to its ideal viscosity?

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

47. This item is based on the following structure of an organic molecule.



Which one of the following chemical characteristics best fits the molecule in the above diagram? It is

A. an aldose monosaccharide.
B. a ketose monosaccharide.
C. a non - reducing sugar.
D. a monomer of lactose.

48. If 20 amino acids form a polypeptide chain through condensation reaction, the total amount of peptide bond and water molecule produced will be

A. 20.
B. 40.
C. 19.
D. 38.

49. A unique configuration and a specific function of proteins biological catalysts is the result of which structure?

A. Primary structure
B. Tertiary structure
C. Secondary structure
D. Quaternary structure

50. Enzymes specificity is best explained by the fact that they
A. are all proteins.
B. speed up a reaction without being used up.
C. catalyze one reaction only.
D. are destroyed by excessive heat.

51. Grade 11 students were asked to group unknown enzymes labeled A, B and C by conducting simple experiments. After conducting the experiments, they found the following results.

Enzyme A - catalyzed reactions by changing the molecular form of the substrate
Enzyme B - catalyzed reactions by breaking bonds through the addition of water
Enzyme C - catalyzed reactions by transferring hydrogen atoms from one molecule to another

Based on the above results, to which classes of enzymes should they group the unknown enzymes A, B and C, respectively?
A. Isomerase, hydrolase, oxidoreductase
B. Transferase, isomerase, lyase
C. Oxidoreductase, hydrolyase, lyase
D. Isomerase, lyase, hydrolase

52. If the action of an enzyme is based on the lock-and-key model, it is expected that the
A. size of the active site is similar to that of the substrate.
B. binding of the substrate molecules produces a conformational change in the active site.
C. active site changes its shape to accommodate the substrate.
D. shape of the active site is complementary to the substrate.

53. Which one of the following vitamins is used for synthesis of cofactors?
A. Vitamin D
B. Vitamin A
C. Riboflavin
D. Vitamin E

54. How does temperature above the optimum level affect the activity of an enzyme? By
A. reducing the activation energy of the enzyme molecule.
B. changing the three dimensional structure of an enzyme.
C. hydrolyzing the peptide bonds in the enzyme molecule.
D. increasing ionic interactions at the active site of the enzyme.

55. A student placed equal numbers of potato tubers with similar sizes in test tubes labeled 'A' adjusted to PH 7, 'B' adjusted to pH, 2; 'C' adjusted to pH 4 and 'D' adjusted to pH 1.5. The student monitored the rate of evolution of gas by adding equal amounts of hydrogen peroxide into the test tubes. The highest evolution of gas was observed at pH 4 even though activities were observed at all pH values. What would the conclusion of the experiment be?
A. Catalase is affected by substrate concentration.
B. Kinetic energy of the molecules is highest at pH 4.
C. Activity of catalase increases as pH increases.
D. The optimum pH for the activity of catalase is about 4.

56. Which enzyme acts best on protein in the small intestine?
A. Pepsin
B. Amylase
C. Trypsin
D. Catalase

57. Among the following scientists who discovered motile unicellular organisms for the first time?
A. Robert Hooke
B. Anton van Leeuwenhoek
C. Matthias Schleiden.
D. Rene Dutrochet.

58. Which one of the following is the function of smooth endoplasmic reticulum?
A. Synthesis of proteins
B. Modification of molecules
C. Detoxification of toxic metabolites
D. Synthesis of ATP molecules

59. Which one of the following statements is correct about prokaryotic and eukaryotic cells? They both have
A. selectively permeable membrane.
B. linear DNA molecule.
C. membrane bounded nucleus.
D. equal level of division of labor in their cells.

60. Which one of the following comparisons between the Davson-Danielli and Fluid Mosaic models is correct? Both models assumed that
A. phospholipid bilayer is sandwiched between protein layers.
B. proteins are sandwiched between the phospholipid bilayer.
C. proteins and phospholipids make the structure of the plasma membrane.
D. the phospholipid in the membrane give a patchwork appearance when viewed from the outside.

61. What is the function of peripheral proteins of the membrane?
A. moving specific ions
B. maintains shape of cells and fluidity
C. anchoring integral proteins to the cytoskeleton
D. acts as receptor for hormone

62. A student took four freshly collected, washed and dried carrot sticks of equal weight. Then she transferred two of them to a container filled with distilled water and the other two to concentrated salt solution. She recorded the weight of the sticks before and after the experiment. Which one of the following is correct about the results of the experiment? The mean weight of the carrot sticks
A. increases under both experimental conditions.
B. is higher for those placed in distilled water.
C. is higher for those placed in concentrated salt solution.
D. is the same under both conditions before and after the experiment.

63. What is the final electron acceptor when glucose respired anaerobically in animal cells?
A. Pyruvate
B. NAD
C. Lactate
D. ATP

64. Which one of the following is correct about the role of electron carrier molecules?
A. Reduced FAD is used to reduce pyruvate to lactic acid.
B. Reduced NAD and FAD pump protons into the inter-membrane space during aerobic respiration.
C. Reduced NAD and FAD are associated with the production of the majority of the ATP molecules in a cell.
D. The source of energy for ATP molecules produced in the Krebs cycle is oxidation of reduced NAD and FAD.

65. During electron transport chain and chemiosmosis, protons are pumped out of the
A. outer membrane to the cristae.
B. matrix into the inter membrane space.
C. mitochondrion to the cytoplasm.
D. nucleus to the mitochondrion.

66. Which one of the following respiratory substrates generates less ATP than the others?
A. Glucose
B. Protein
C. Lipid
D. Polysaccharide

67. During cyclic photophosphorylation of the light dependent reactions of photosynthesis,
A. NADPH is formed.
B. H_2O is the source of electrons.
C. oxygen is produced.
D. photosystem I is involved.

68. How many molecules of NADPH are required to reduce six molecules of carbon dioxide to glucose?
A. 6
B. 18
C. 12
D. 24

69. Which one of the following statements is correct about photorespiration? It occurs
   A. when ribulose bisphosphate reacts with carbon dioxide at high temperature.
   B. due to reduction in the concentration of carbon dioxide in the leaves of plants in the tropics.
   C. when carbon dioxide reacts with phosphoenol pyruvate in the leaves of desert plants.
   D. due to increase in the concentration of triose phosphate in the leaves of plants at high temperature.

70. Which one of the following comparison between the C3 and C4 plants is correct? C3 plants
   A. lack mesophyll cells, but C4 plants have bundle sheath cells.
   B. carry out the Calvin cycle in mesophyll cells, but C4 plants in bundle sheath cells.
   C. fixes carbon dioxide in the mesophyll cells, but C4 plants in the bundle sheath cells.
   D. synthesizes glucose in the bundle sheath cells, but C4 plants in the mesophyll cells.

71. Which one of the following statements is correct about bacteria cell structures?
   A. Endotoxin is the cell wall component of Gram positive bacteria.
   B. Bacterial DNA is associated with histones.
   C. Thick layer of peptidoglycan is found in Gram negative bacteria.
   D. Bacterial cell wall is made up of sugars and amino acids complex.

72. What is the germ theory of disease? It is the theory that states
   A. microorganisms can easily grow in non- sterilized foods.
   B. pathogens evolve mechanisms to escape from the immune system.
   C. microorganisms are the causative agents of diseases.
   D. microorganisms can be eliminated by autoclaving.

73. Which one of the following is correct about industrial production of vinegar? It is produced through the
A. oxidation of ethanol under aerobic conditions.
B. decomposition of sulphur containing organic molecules.
C. hydrolysis of nitrogen containing organic molecules.
D. reduction of sulphur dioxide under controlled conditions.

74. Which one of the following comparisons between viruses and bacteria is correct?
A. Bacteria have flagella, but viruses have cilia.
B. Viruses contain protease enzymes, but bacteria don't have.
C. Bacteria are unicellular, but viruses are acellular.
D. Viruses are saprotrophs, but bacteria are chemotrophs.

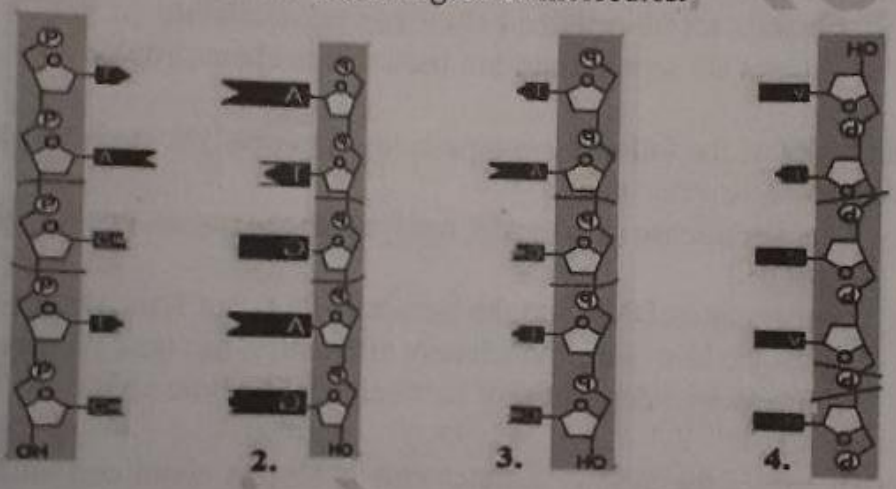
75. Which one of the following comparisons between lytic and lysogenic phage is correct? Lysogenic phage
A. causes disease of host cell, but lytic phage causes genetic alteration of host cell.
B. integrates its DNA into the host cell DNA, but lytic phages can't.
C. lyses the host cells immediately after entry, but lytic phages can't.
D. reproduces independent of host cells unlike lytic phage.

76. Which one of the following statements is correct about codominance? It is the pattern of inheritance where
A. both alleles are masked in the heterozygous individuals.
B. the dominant allele is expressed and the recessive is masked.
C. both alleles of a gene are equally expressed in heterozygous individuals.
D. expression of the dominant allele is relatively higher than the recessive.

77. What is cloning? It is the process
A. of producing phenotypically different offsprings.
B. transferring gene from one organism to another.
C. inserting a foreign gene into an organism.
D. of producing genetically identical organisms.

78. Which one of the following statement is correct about anaphase I of meiosis?
A. Chromatids from each chromosome separate and move to the opposite poles.
B. pairs of homologous chromosomes line up at the equator of the cell.
C. pairs of homologous chromosomes split and move to the opposite poles.
D. Sister chromatids of homologous chromosomes pair up and exchange segments.

79. This item is based on the following DNA molecules.



Which of the above DNA strands can possibly form a double helix?
A. Strands 1 and 2
B. Strands 2 and 3
C. Strands 2 and 4
D. Strands 1 and 4

80. A non-predictable random change in the genetic material of an organism is
A. expression.
B. recombination.
C. mutation.
D. segregation.

81. Lamarck believes about natural tendency towards perfection, whereas Darwin believes about
A. descent with modification.
B. inheritance of acquired traits.
C. use and disuse of an organ.
D. movement of species towards simplicity.

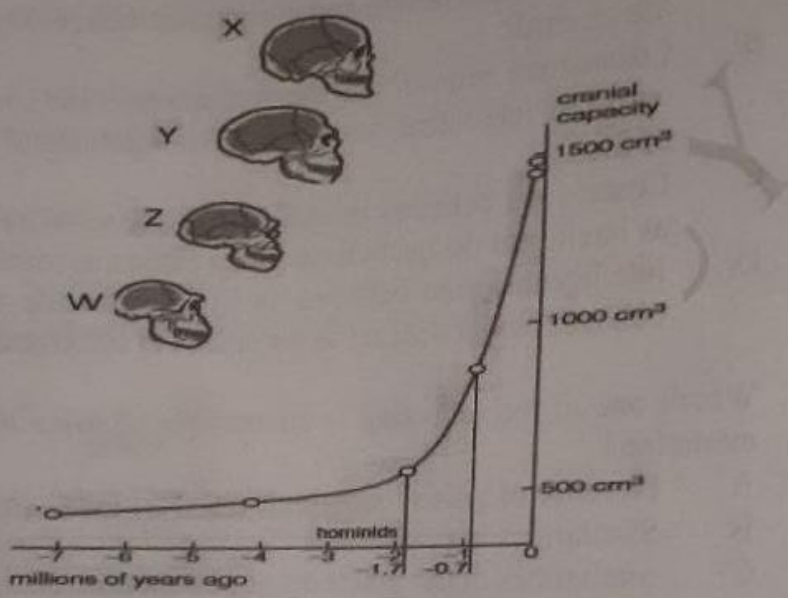
82. Which one of the following comparisons between cosmozoan and intelligent design regarding to the origin of life is correct?
A. Both intelligent design and Cosmozoan believed God as the creator of life on earth.
B. Cosmozoan believed chemical reaction as the source of life on earth where as intelligent design believed supernatural power as the origin of life.
C. Cosmozoan believed in used and disuse as source of variation where as intelligent design believed in evolution as source of variation.
D. Intelligent design believed as God creates life where as cosmozoan believed another planet as the source of life on earth.

83. Which one of the following is an example of paleontological evidence for evolution?
A. Presence of gills slits during embryonic development.
B. Similarities in cytochrome C of the electron transport chain.
C. Similarities in the functions of analogous structures.
D. Presence of coprolite of animals hardened into stone.

84. Some palms survive better in volcanic acidic soil whereas others perform better in calcareous soil. Palms growing on calcareous soil tend to flower latter than palms growing in volcanic soil. Which of the following events can be best exemplified by this scenario?
A. Temporal isolation and directional selection
B. Geographical isolation and stabilizing selection
C. Seasonal isolation and disruptive selection
D. Behavioural isolation and directional selection

85. Which bacterial species play a role in degrading pyrite (FeS_2) and chalcopyrite ($CuFeS_2$) in bio-mining?
A. *Thiobacillus ferrooxidans* and *Thiobacillus thiooxidans*
B. *Leptospirillum ferrooxidans* and *Thiobacillus thiooxidans*
C. *Thiobacillus ferrooxidans* and *Leptospirillum ferrooxidans*
D. *Leptospirillum ferrooxidans* and *Thiobacillus organoparus*

86. This item is based on the following diagram that shows the brain size of different hominids (the recent four) in the human evolution.



Which one of the following best describes human evolution in the above diagram? Compared to the other hominids,

A. 'X' runs faster and plans to avoid attacks.
B. 'Y' develops and uses modern weapons.
C. 'W' plans in advance to avoid attacks.
D. 'Z' moves in a more upright posture.

87. Which one of the following is correct about the general features of protozoa. They

A. are multicellular organisms.
B. are all prokaryotic organisms.
C. have true nucleus.
D. all are parasitic.

88. A cleaning technique that mechanically removes microorganisms to reduce the level of contaminants is

A. sanitization.
B. disinfection.
C. preservation.
D. antiseptic.

89. Which of the following is NOT true about metabolism. It
A. takes place within each cell.
B. synthesizes new organic molecules.
C. involves catabolic reactions to form larger biomolecules.
D. produce energy for vital processes occurring in cells.

90. A Biology teacher conducted an experiment to separate photosynthetic pigments from cabbage leaves. Then, he observed deep green band of a pigment distinctively. This colour confirms the presence of
A. chlorophyll a.
B. chlorophyll c.
C. chlorophyll b.
D. carotenoids.

91. Which one of the following statements is true about the contribution of photosynthesis? It
A. removes oxygen from the atmosphere.
B. replenishes carbon dioxide in the air.
C. is a direct/indirect source of food for human and animals.
D. maintains the balance of oxygen and carbon dioxide in the atmosphere.by releasing them equally.

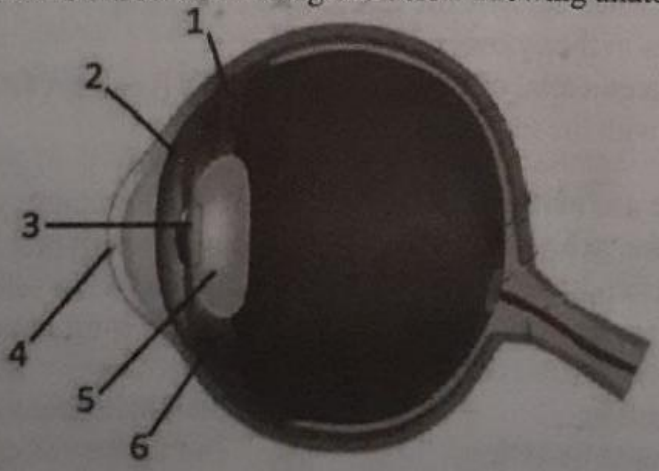
92. Which of the following is true about the process of Kreb's cycle?
A. It starts when acetyl-CoA reacts with citric acid.
B. It occurs in the cytosol of a cell.
C. It produces a total of 2 NADH and 1 $FADH_2$ and 6ATP.
D. It ends with the regeneration of oxaloacetate.

93. Suppose there are moths with three different wing colours: white, grey and black. Of these, white and black are extreme phenotypes and grey is an intermediate phenotype. Based on this description, what selection pressure, do you think, is at work if only moths with grey wing colour are selected for?
A. No selection
B. Directional Selection
C. Stabilizing selection
D. Disruptive selection

94. Suppose there are two populations of foxes ("A" and "B") living in a certain forest area where fox "A" population is more adapted to its environment than the fox "B" population. Based on this information, which of the following inferences is correct? Population of
A. fox "A" is less fit to survive in the environment than fox "B".
B. fox "A" reproduces in higher rate than fox "B".
C. fox "B" passes its advantageous alleles to its offspring more than fox "A".
D. fox "B" reproduces in greater number than fox "A".

95. Which of the following features distinguish bottleneck effect from founder effect?
A. Bottleneck effect occurs via catastrophe whereas founder effect occurs via colonization
B. Bottleneck effect occurs via colonization whereas founder effect occurs via catastrophe
C. In bottleneck effect, the allelic frequencies are exactly the same before and after the event but not in founder effect
D. In founder effect, the allelic frequencies are exactly the same before and after the event but not in bottleneck effect

96. This Item is based on the diagram below showing anatomy of human eye.



The structure of the eye, which controls the diameter of the pupil, and that, which supports the position of the lens, respectively, are
A. 2 and 6.
B. 3 and 5.
C. 1 and 4.
D. 4 and 2.

97. Which one of the following alternatives shows the correct order of human ear structures from the outer to the inner part?
   A. Pinna →Eardrum → Ear canal → Ear ossicles →Cochlea → Semicircular canals
   B. Pinna → Ear canal → Eardrum → Ear ossicles → Semicircular canals → Cochlea
   C. Pinna → Ear canal →Semicircular canals → Ear ossicles → Eardrum Cochlea
   D. Pinna →Ear ossicles → Eardrum → Ear canal →Semicircular canals → Cochlea

98. Which of the following statement is true about circadian rhythm?
   A. It is controlled by adrenalin and melatonin hormone
   B. It is driven by only external factors
   C. It functions only during the day time when humans are active.
   D. It is the body's physiological response to light -dark cycle.

99. Which of the following sentences correctly summarize the function of endocrine glands? Endocrine glands
   A. secret hormones that regulate physiological processes.
   B. are duct glands whose secretions are contained in a tube.
   C. mainly produce both hormones and enzymes.
   D. secretions act on their target organs very slowly.

100. Climate change is a global phenomenon characterized by changes in
   A. weather conditions of an area.
   B. the wind direction.
   C. the level of precipitation.
   D. usual climate of the planet.

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THE END