EDUCATIONAL ASSESSMENT AND EXAMINATIONS SERVICE (EAES)

ETHIOPIAN SECONDARY SCHOOL LEAVING CERTIFICATE EXAMINATION (ESSLCE)

Hamlie, 2016 E.C /July, 2024 G.C

Subject Code: 06 **Booklet Code: 155**

Item Number: 100 **Time Allowed: 2:30 Hours**

answer provided by @ethiomatric

1. Gene flow is the movement of genetic material

D
A. without altering the allele frequencies.
B. that drives a population towards perfection.
C. without affecting the balance of gene pool of a population.
D. where organisms either join or leave a population.

2. Which one of the following options is a constituent of peripheral nervous system?

C
A. Afferent nerves, brain and automatic motor nerves
B. Somatic sensory nerves, spinal cord and efferent nerves
C. Afferent nerves, efferent nerves and somatic motor nerves
D. Spinal cord, afferent nerves and somatic sensory nerves

3. Which one of the following structures of neurons is correctly paired with its function?

B
A. Axon - receives signal from muscle
B. Cell body - maintains structure and supply energy
C. Dendrites - protects the neuron and insulate it
D. Myelin sheath - reduces nerve impulse transmission

4. Which one of the following statements explain how nerve impulse is occurred? It occurs as a result of

A
A. charge difference across the membrane of axon.
B. the movement of neurotransmitter molecules into myelin sheath.
C. balanced charge across the membrane of dendrites.
D. the movement of neurotransmitter molecules out of cell body.

5. B Which one of the following statements is an acceptable justification of the importance of synapse? Synapse is
   A. the mechanism of protecting the axon from external damage.
   B. a connection between the appendages of consecutive neurons.
   C. a conductor of action potential towards the end of the dendrite.
   D. the facilitator of the reverse flow of neurotransmitter chemical in neurons.

6. C Assume your friend has a blood type that has no antigen on his red blood cells but produces antibodies a and b, loses blood due to a car accident. If blood transfusion is necessary to save his life, your friend can receive blood from someone with
   A. blood type AB.
   B. blood type B.
   C. blood type O.
   D. blood type A.

7. C The binomial system of naming developed by Linnaeus comprises two names. Which hierarchical groups are used?
   A. Order and family
   B. Kingdome and species
   C. Genus and species
   D. Kingdome and phylum

8. A Which one of the following is the feature of kingdom Monera? Its members are
   A. unicellular without separated nucleus.
   B. multicellular with cell walls.
   C. mainly autotrophic and saprophytic.
   D. reproduced by hypha formation.

9. C Which alternative given below is comprised of harmful groups from the kingdom Monera, Protista and Fungi, respectively?
   A. *Trypanosoma*, *Plasmodium falciparum* and *Haemophilus ducreyi*
   B. *Candidaalbicans*, *Mycobacterium tuberculosis* and *Trypanosoma*
   C. *Haemophilus ducreyi*, *Trypanosoma* and *Tinea pedis*
   D. *Trypanosoma*, *Plasmodium falciparum* and *Pencicillum*

10. Which one of the following is a feature of *Octopi* and *squid* in phylum mollusca? They have

B

A. segmented body with head and thorax.
B. well-developed brain.
C. lung as a breathing structure.
D. hard muscular foot with a hard body.

11. What mechanism was used by Gregor Mendel to protect the garden peas from self-pollination? He

A

A. opened the flower bud before pollen matured.
B. sterilized the male part of the flower using chemicals.
C. covered the flower and protects it from pollinating agents.
D. selected pure dominant traits for breeding.

12. Gregor Mendel crossed two pure-breeding traits of pea plants in his experiment and found only one of the traits expressed in the first generation. This shows that the

D

A. expressed trait must be determined by the recessive allele.
B. two traits in the F1 generation were equally expressed.
C. alleles masked in the F1 generation were lost due to mutation.
D. expressed trait must be determined by the dominant allele.

13. Which one of the following statements correctly describes chromosome structure?

D

A. The pair of chromosomes is heterozygous in nature.
B. Chromosomes are similar to a gene in structure.
C. The DNA is wrapped with ribose sugar to form a chromosome.
D. Chromosomes are made up of histone bounded DNA.

14. The breeding mechanism that improves the performance of animals or plants using particular traits is

B

A. self-breeding.
B. selective breeding.
C. test cross.
D. combination of traits.

15. Which one of the following birth control methods is correctly matched with its function?

A

A. Hormonal method - prevents follicle development and ovulation
B. Physical method - reduces the lining of the uterus
C. Surgical method - avoids early embryo implantation
D. Natural method - prevent the ovum from reaching to the uterus

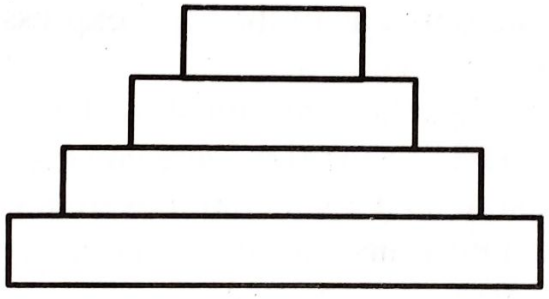
16. The ability of carnivores to survive in an ecosystem is dependent on the availability of prey. This can be considered as

D

A. abiotic factor.
B. catastrophic factor.
C. edaphic factor.
D. biotic factor.

17. This item is based on the following pyramid of biomass.

B



Which alternative contains organisms that can occupy the above pyramid of biomass from the bottom to the top?

A. Grass, Cricket, Chicken and Lizard
B. Grass, Cricket, Lizard and Chicken
C. Grass, Chicken, Cricket and Lizard
D. Grass, Lizard, Cricket and Chicken

18. The two reverse processes that play a significant role in absorbing and releasing carbon dioxide, respectively are

D

A. combustion and photosynthesis.
B. decomposition and respiration.
C. respiration and assimilation.
D. photosynthesis and respiration.

19. Which one of the following adaptations is important for survival of polar bear in very cold environments? Having

B

A. smaller size
B. blubbers under the skin
C. fine silky fur
D. thick wrinkled ears

20. A student concluded that the stage of meiosis on a prepared slide of plant tissue he observed was Anaphase II. What do you think was the reason to come to this conclusion? Observation of

A

A. divided centromere and separated sister chromatids
B. reformed nuclear envelope and reappearance of nucleolus
C. one chromosome from each homologous pairs at the poles
D. crossing over between non-sister chromatids of homologous pairs

21. Which one of the following plant species is endemic to Ethiopia?

D

A. *Percica papaya*
B. *Aurocaria baramúleta*
C. *Eucaliptus globulose*
D. *Guizotia abyssinica*

22. Which one of the following national parks of Ethiopia is declared as the world's heritage site and comprises endemic animals like Walia ibex?

B

A. Yangudi Rassa National Park
B. Simien Mountain National Park
C. Rift Valley National Park
D. Bale Mountain National Park

23. A mother milks her cow every morning and the milk usually forms curd after three days. What is the first step to investigate why this change happens?

D

A. Take action to prevent the milk from curdling
B. Read scientific articles about the reason for curdling of milk
C. Formulate hypothesis about the reason for milk curdling
D. Ask a question why the milk forms curd

answer provided by @ethiomatric

24. A drug efficacy test was conducted under similar set up on two groups of infected mice (A and B), groups A were the control whereas group B were experimental group. A student gave a placebo to the control group and the drug to the experimental group. At the end, the experimental group got better. Which one of the following is true about the result?

B

A. Conclusion cannot be reached.
B. The drug has an effect.
C. Placebo has better effect.
D. The experiment was wrong.

25. Suppose you did an experiment in a biology laboratory and need to report your work to your biology teacher. Which one of the following steps is correct to report the finding?

C

A. Title→Procedure→Result→Hypothesis→Prediction → Evaluation → Conclusion → Acknowledgment
B. Title→Hypothesis→ Procedure → Prediction →Conclusion → Result → Evaluation→ Acknowledgment
C. Title→Hypothesis→Prediction→Procedure→Result→Conclusion → Evaluation → Acknowledgment
D. Title→ Prediction→ Procedure→ Hypothesis→ Result→ Conclusion → Evaluation→ Acknowledgment

26. Which one the following statements explains how the allosteric inhibitors affect enzymes activities ? By binding to the

B

A. substrate and preventing it from binding to the active site
B. site other than the active site and altering the shape of the active site
C. active site of an enzyme and blocking the substrate
D. active site and altering the shape of the enzyme

27. Why are enzymes considered special molecules in metabolism? Because

B

A. metabolic processes can produce special products in the presence of enzymes.
B. enzymes facilitate metabolic reactions under controlled physiological conditions.
C. enzymes are protein molecules that act as a source of energy.
D. reactions can't totally take place in the absence of enzymes.

28. Which of the following is the most advanced and recent event in the history of cell biology?
D
A. Discovery of the double-helix structure of DNA
B. Enovation of the first scanning electron microscope
C. Description of the Golgi apparatus
D. Sequencing of the human genome

29. A student focused a slide of an onion epidermal cell on pre-estimated width of 2 millimeter field of view under a microscope. What will be the width of each individual cell if you count 8 cells that fit to the field of view during your observation?
C
A. 16 millimeter
B. 0.40 millimeter
C. 0.25 millimeter
D. 4 millimeter

30. Which one of the following statements is correct about the differences between eukaryotic and prokaryotic cells? Prokaryotic cells have
B
A. membrane bound organelles whereas eukaryotic cells don't have it.
B. small ribosomes whereas eukaryotic cells have large ribosomes.
C. cell wall whereas eukaryotic cells don't have cell wall.
D. division of labor whereas eukaryotic cells don't have it.

31. Which biological tool is correctly matched with its function?
A
A. Petri dishes - to culture microorganisms
B. Burette - to measure mass of a substance
C. Centrifuges - to collect insects
D. Theodolite - to measure the rate of water flow

32. A student centrifuge a solution containing plant material in order to separate them based on their mass. After 10 minutes of centrifugation some of the components move to the bottom (A), others to the middle layer (B) and the remaining once to the top layer (C).Which alternative shows the mass of the components in decreasing order?
B
A. C>A>B
B. A>B>C
C. B>A>C
D. A=B=C

33. Which one of the following statements shows the future promise of biological sciences?

B

A. Finding alternative living place for human population
B. Using stem cells to repair damaged organs and grow new organ
C. Finding the adaptation mechanism of plant in new condition
D. Advising the government on how to conserve environment

34. Which one of the following alternatives contains only organic molecules?

C

A. Glucose, carbon dioxide, glycine and linoleic acid
B. Methane, calcium carbonate, linoleic acid and glucose
C. Methane, glycine, linoleic acid and glucose
D. Linoleic acid, glucose, calcium carbonate and methane

35. Which one of the following properties permits insects to freely walk on water? Its high

D

A. specific heat capacity
B. adhesive force
C. latent heat of vaporization
D. surface tension

36. Which one of the following properties of enzymes shows their catalytic nature?

B

A. Being non-specific to substrates
B. Reducing the activation energy
C. Being altered in a chemical reaction
D. Changing the nature of the product

37. If an enzyme is named as "EC 3.4.11.1." in a systematic naming, what does the number "3" represents? It represents the

D

A. sub-subclass of an enzyme in relation to its protein nature.
B. ultra-subclass of an enzyme that is related to the place where they act.
C. sub-class of an enzyme in relation to the source from where it was discovered.
D. main class of an enzyme which indicates the type of reaction it catalyses.

38. In the lock-and-key model of enzymatic action, the activation energy is lowered through

A

A. provision of alternative pathway for the reaction.
B. straining of the substrate molecules bound to the active site.
C. conformational change of substrate molecules.
D. permanent modification of the active site of the enzyme.

39. Which one of the following minerals are used as cofactor for the enzyme alcohol dehydrogenase?

D

A. Cobalt ions
B. Magnesium ions
C. Ferrous ions
D. Zinc ions

40. A student made an experiment to observe the effect of temperature on catalase of mashed potato. After three parallel trials, he obtained the following results.

B

Temperature/°C	Time taken to collect 33 cm^3 in seconds				Rate
	Trial 1	Trial 2	Trial 3	Mean	cm^3/sec
10	54	47	43	48	0.69
20	12	14	16	14	2.36
30	5	5	5	5	6.6
45	14	11	11	12	2.75
50	73	71	57	67	0.5
55	119	109	132	120	0.27

At which temperature was the reaction fastest?

A. 10°C
B. 30°C
C. 50°C
D. 55°C

41. Which one of the following organic molecules has ester bonds in its molecular structure?

A

A. Triglyceride
B. Glycogen
C. Amino acid
D. Cellulose

42. Which one of the following statement is correct about the structural organization of hemoglobin? It is formed

A

A. when a polypeptide chain folds itself during protein synthesis.
B. through the association of two or more polypeptide chains.
C. through folding of secondary structure of a polypeptide chain.
D. by hydrogen bonding between quaternary and tertiary structures.

43. The presence of large amount of lipid reduces the density of an animal. Which function of triglycerides is related to this fact?

B

A. Thermal insulation
B. Buoyancy
C. Waterproofing
D. Respiratory substrate

44. The missing number represented by the letter "n" in the formula of maltose ($C_{12}H_nO_{11}$) is

D

A. 12.
B. 11.
C. 24.
D. 22.

45. According to biological scenario, structure is related to function, which one of the following is correctly described?

C

A. Trachea - millions of air sacs for diffusion of O_2 and CO_2
B. Alveoli- supported by cartilage for swallowing food
C. Nasal passage - large surface area with hairs for filtration of air
D. Larynx - hair like strictures for mucus production

46. As compared to the exhaled air, the inhaled air contains

D

A. 70% oxygen, 0.03% carbon dioxide and 30% nitrogen.
B. 16% oxygen, 4% carbon dioxide and 80% nitrogen.
C. 80% oxygen, 20% carbon dioxide and 0.04% nitrogen.
D. 21% oxygen, 0.04% carbon dioxide and 80% nitrogen.

answer provided by @ethiomatric

47. A student conducted a food test on three unknown food samples and obtained results as presented in the table below.

D

No	Procedures used	Colour changes of the food samples after the experiment		
		Food sample 1	Food sample 2	Food sample 3
1	Mixed with Benedict's reagent and heated	Blue	Red	Yellow
2	Mixed with ethanol and poured into water	Colourless	Colourless	Colourless
3	Mixed with Biuret's reagent	Mauve	Mauve	Mauve
4	Iodine solution	Brown	Brown	Brown

What do you conclude from the result of the above experiment?

A. Lipids and reducing sugars are absent from all the three food samples tested.
B. Proteins and reducing sugars are found in all the food samples at equal concentrations.
C. Non - reducing sugars are present in all the food samples at different concentrations.
D. Reducing sugars are found in two of the samples and proteins are found in all the samples.

48. What is the scientific reason behind the preference of high altitude areas for training by the Ethiopian Athletes? Because

A

A. the RBCs produced are more efficient than those at low altitude.
B. it helps them to adapt to the high atmospheric pressure of mountains.
C. the oxygen density is higher than the low altitude.
D. it helps them to increase their lung capacities.

49. How does oxygen is transported in the human body? It is transported
C
A. by simple diffusion along concentration gradient from the lungs to the heart.
B. from the red blood cells to actively respiring tissues by facilitated diffusion.
C. from the lungs to actively respiring tissue by hemoglobin of RBC.
D. by the blood plasma from lower concentration to higher concentration.

50. Which one of the following statements is well justified, why the left ventricle is tough in nature? Because it
A
A. forces oxygenated blood out of the heart.
B. returns deoxygenated blood to the heart.
C. returns oxygenated blood to the heart.
D. forces deoxygenated blood out of the heart.

51. Which one of the following statements is true about female genital mutilation? It
C
A. gives acceptance for marriage.
B. helps to deliver baby easily.
C. imposes risk of infection.
D. keeps girls pure and honest.

52. Assume that you have a friend who is HIV positive and you are familiar about the case. How can you support your friend if she is injured and needs your help?
A
A. Help your friend with precautions
B. Ignore your friend because of the virus
C. Call to other people to protect you from the virus
D. Help your friend without any fear of the virus

53. Why are root hairs efficient in uptake of water from the soil? Because they
D
A. anchor the plant to the ground.
B. show positive hydrotropism.
C. keep turgidity of the cell.
D. have high surface area to volume ratio.

54. What will happen to a plant if the apical dominance is removed through repeated pruning? The
C
A. plant shades its leaves to withstand the condition.
B. plant elongates and bends to one direction.
C. side shoots grow quickly and the plant becomes bushy.
D. growth of the lateral shoots will be inhibited.

55. A farmer sowed cotton seeds in a farm land which fulfills the optimum conditions for germination. After a few days, he observed the newly growing seedlings. Which of the following statements is correct about the farmer's observation? The
A
A. growth of plumule above the soil surface
B. remaining of the cotyledon below the ground
C. hypogeal germination of the hypocotyl
D. growth of plumule without forming a hook

56. Which one of the following is the main function of Bowman's capsule of the human kidneys?
C
A. Mineral reabsorption
B. Prevent back flow of urine
C. Ultrafiltration of blood
D. Water preservation

57. What is the justification for feeling warm while sweating a lot in a very humid condition?
A
A. The lower rate of evaporation of water from the skin surfaces
B. Closure of the glands in the epidermal layer of the skin
C. An increase in metabolic rate as temperature increases
D. Unequal distribution of ions on membrane of cells

58. As a result of human activities, huge amount of carbon dioxide has been accumulated in the atmosphere. What is the consequence of this phenomenon?
C
A. Drop in temperature of the earth and death of aquatic organisms
B. Increased rate of uptake of carbon dioxide by green plants
C. Preventing certain amount of heat escaping back to the space
D. Reduction in the sea level and death of aquatic animals

59. Among the following statements, one briefly describes the concept of climate change. It is the
D
A. sudden change in an average rain fall of a limited area.
B. radical change of local weather condition that sustain for less than a year.
C. gradual change of atmospheric temperature over a short period of time.
D. global change in the temperature, precipitation and wind conditions.

60. What was the main objective of the United Nations Framework Convention on Climate Change (UNFCCC)?
B
A. Reduction of the monopole utilization of border crossing rivers to prevent climate change
B. Prevention of dangerous man - made interference with the climate system
C. Donation of high carbon projects related to climate change by the developed countries
D. Prohibition of developing countries from setting up big industries that could affect the climate

61. Which one of the following research activities has been conducted at Armauer Hansen Research Institute?
D
A. Improving crop production through genetic engineering
B. Conserving the genes of endemic plants and animals
C. Assessing the nutritional status of mothers and babies
D. Developing drugs for leshmaniasis and tuberculosis

62. Which one of the following alternatives contains only protein rich cereals?
B
A. Red kidney peas, maize and white pea
B. White kidney peas, red kidney peas and chickpea
C. Barley, chickpea and groundnut
D. Wheat, red kidney peas and sesame

63. Which one of the following statements is correct about the process of digestion in the stomach?

A

A. Pepsin hydrolyzes protein molecules into amino acids.
B. Lipase hydrolyzes fat molecules into fatty acids and glycerol.
C. Amylase hydrolyzes starch molecules into maltose.
D. Bile hydrolyzes bigger fat molecules into smaller droplets.

64. Which one of the following statements is correct about the role of trypsin in digestion? It acts on

D

A. lipids in the small intestine.
B. maltose in the mouth.
C. starch in the stomach.
D. protein in the small intestine.

65. Which one of the following descriptions about absorption of nutrients in the digestive system is correct?

B

A. Glycerol molecules are first absorbed into the hepatic portal vein and then to lacteal.
B. Amino acid molecules are directly absorbed from small intestine into the blood.
C. Glucose molecules are first absorbed into the lacteal and then enter into the blood.
D. Fatty acids molecules are absorbed from small intestine directly into the blood.

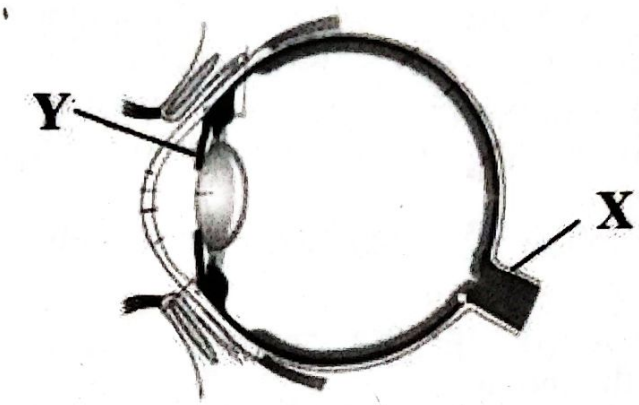
66. What is the main function of the dermis of the skin?

D

A. Production of skin pigments
B. Prevention of the entry of pathogens
C. Synthesis of hair and nail proteins
D. Temperature regulation in homeostasis

67. This item is based on the following diagram about eye structure.

B



The part of the eye represented by letter "Y" is

A. ciliary muscle.
B. iris.
C. optic nerve.
D. pupil.

68. A man observed elementary school students spinning around, and realized that none of them could properly walk upright after sudden interruption of the spinning. Which one of the following is the correct reason for this condition?

C

A. The fluid in the semi secular canal stopped immediately when the body stopped spinning.
B. The sensory cells were unable to detect stimulus after the spinning was quitted.
C. The fluid in the semicircular canal kept moving after the spinning was interrupted.
D. The nerve impulse was transmitted after the spinning was stopped.

69. Which of the following is the correct description of hormones? They are chemical messengers that

B

A. transmit message faster than the nerve system.
B. regulates many physiological process.
C. targets only the site of secretion.
D. are produced in glands that contain ducts.

70. Homeostasis is a mechanism of
A
A. keeping internal body environment constant.
B. adjusting the environment relative to body condition.
C. keeping external environment stable.
D. protecting the body from pathogens.

71. Which one of the following arrangement of molecules in the fluid mosaic model of the cell membrane is correct?
D
A. Phospholipids fill the protein like a sandwich to retain its rigidity.
B. Phospholipid molecules are peripherally attached to proteins.
C. Phospholipids are inserted into the bilayer of protein molecules.
D. Protein molecules are studded between the phospholipid bilayers.

72. What is the role of cholesterol in the cell membrane? It
B
A. anchors integral proteins to the cytoskeleton.
B. reduce the fluidity of the cell membrane.
C. acts as receptor site for hormones and other signaling molecules.
D. transports hydrophilic molecules into the cell.

73. This item is based on the following table about the function of cellular organelles.

B

No	Features	Mitochondria	Golgi body	Lysosomes	Ribosomes
1	The site of protein synthesis	NO	YES	NO	YES
2	Modifies and distributes molecules	NO	YES	NO	NO
3	Site of aerobic respiration	YES	NO	NO	NO
4	Digest foreign cells	NO	NO	YES	YES

Which numbers in the above table show the correct function of the given organelles?

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

74. Potato slices of equal weighed were immersed in four different concentrations of salt solutions. The solutions were 1.5, 1.0, 0.5, and 0.1 molars. After a day, the potato slices were reweighted. Which potato slice weights the least? The one from

B

A. 0.1 molars
B. 1.5 molars
C. 0.5 molars
D. 1.0 molars

75. Suppose you took a container and divided it into two halves by a membrane which is permeable to water and labeled the two halves as "A" and "B". Finally, you added hypertonic solution in "A" and hypotonic solution in "B". What will be the expected result of this experiment? The water level of

B

A. "A" remains constant.
B. "B" decreases.
C. both "A" and "B" rise up.
D. "B" rises up.

76. During oxidative phosphorylation, ATP is produced by combining ADP and inorganic phosphate using energy released from

D A. transport of electrons from complex IV to complex I.
B. dehydrogenation of pyruvate to acetyl CoA.
C. decarboxylation of citrate to oxaloacetate.
D. transfer of electrons from $NADH/FADH_2$ to O_2.

77. In a fox population, foxes with thicker fur survived better in cold climate compared to those with thinner fur, however, foxes with thinner fur survived better when the climate was very hot. What type of natural selection is described in this scenario?

D
A. Diversifying selection
B. Stabilizing selection
C. Disruptive selection
D. Directional selection

78. Which one of the following comparisons between substrate level and oxidative phosphorylation is correct? During substrate-level phosphorylation

B A. 34 ATP molecules are produced, but in oxidative phosphorylation 4 ATP molecules are produced per glucose molecule.
B. ATP is made in the cytosol and matrix, but in oxidative phosphorylation it is made on the inner membrane of mitochondria.
C. protons are pumped into the inter-membrane space, but in oxidative phosphorylation they are pumped into the cytosol.
D. oxygen is the final electron acceptor, but in oxidative phosphorylation NAD is the electron acceptor.

79. Which one of the following determines the cause and effect of lactate production during physical exercise? The demand for

D A. a substrate that can easily release energy leads to production of lactate which results in muscle fatigue.
B. an easily absorbable molecule leads to the production of lactate that results in muscle fatigue.
C. lower pH in muscle tissues leads to fermentation of respiratory substrates leading to muscle fatigue.
D. more energy causes muscle cells to ferment respiratory substrates leading to muscle fatigue.

80. The view of biochemical origin of life hypothesized that the first life-forms appeared in warm primitive ocean and were heterotrophic. Which one of the following statements can support this idea?

C

A. Life is the inherent property of the universe which permits unlimited existence through usage of resource in it.
B. The appearance of dust of unknown source with microbial spores that can feed on organic molecules.
C. The formation of abundant organic molecules due to radiations and the absence of oxygen led to the primitive living organisms.
D. Resistant spores from meteorites reached to the earth and used organic molecules to survive in the environment.

81. Which statement shows the correct comparison between the Lamarck's and Darwin's theory of evolution?

D

A. Lamarck believed in the development of new traits due to variation while Darwin believed in their occurrence due to use and disuse of organs.
B. Darwin recognized the origin of species was through mutation while Lamarck believed it was through effect of the environment.
C. Lamarck believed the gradual occurrence of changes while Darwin believed in the immediate change of species.
D. Darwin claimed that variation is heritable while Lamarck considers variation as acquired traits.

82. Which of the following is true concerning the evidences of evolution?

C

A. Organisms which have little genetic relationship show similar behavior.
B. Organisms which live in the same area have similar evolutionary history.
C. Species that are closely related share the most similar DNA sequences.
D. Species that live in the same geographic area have the same genetic makeup.

83. In human evolution brain size increased over the courses of evolution. Which alternative contains hominids arranged in an increasing order of brain size?

D

A. *Homo neandertalensis* → *Homo erectus* → *Homo habilis* → *Homo sapiens*
B. *Homo erectus* → *Homo habilis* → *Homo neandertalensis* → *Home sapiens*
C. *Homo erectus* → *Homo neandertalensis* → *Homo habilis* → *Homo sapiens*
D. *Homo habilis* → *Homo erectus* → *Homo neandertalensis* → *Homo sapiens*

84. The type of gene mutation that results in the change of a triplet (GAG) in a normal hemoglobin to another triplet (GTG) in sickle-cell hemoglobin is

C

A. deletion mutation.
B. insertion mutation.
C. substitution.
D. non-disjunction.

85. Which one of the following statements correctly explains the genetic drift? It is a change in allele frequency due to

C

A. independent assortment of chromosomes.
B. non- random mating of individuals in a population.
C. chance based sampling error.
D. relocation of species into other areas.

86. Identify the correct mechanism of bacterial reproduction by conjugation.

D

A. Mitotic spindles are produced to separate bacterial DNA into two equal parts.
B. The recipient bacteria use their pili to pull the donor bacteria during plasmid transfer.
C. Bacteria take up genetic materials of dead organisms and integrate into their DNA.
D. A pair of bacteria come together and exchanges their plasmids.

answer provided by @ethiomatric

87. Which one of the following features is **NOT** the characteristic feature of fungi? They

C

A. have haploid nuclei and multinucleate hypha.
B. reproduce asexually through spore production.
C. are either autotrophic, parasitic or saprophytic.
D. exhibit apical growth of networked hypha.

88. What is the argument behind the need of appropriate host cell for viruses to replicate themselves? Because viruses

C

A. are obligate saprophyte that can only replicate inside a cell.
B. have cell surface antigen specific to a given cell type.
C. lack metabolic capacity to produce energy outside cells.
D. lack of double strand DNA to duplicate themselves.

89. Which one of the following diseases and their mode of transmission is correctly matched?

A

A. Salmonellosis - contaminated food
B. Candidiasis - droplet infection
C. Chicken pox - fecal-oral-route
D. Common cold - direct contact

90. What is the basic difference between anabolism and catabolism?

C

A. Anabolism is related to respiration while catabolism is to photosynthesis.
B. Catabolism is condensation while anabolism is hydrolysis reaction.
C. Anabolism is energy absorbing while catabolism is energy releasing process.
D. Catabolism is a constructive while anabolism is destructive reaction.

91. A transgenic organism is an organism that

C

A. replicates its DNA without control.
B. can undergo chromosomal non-disjunction.
C. has received genetic material of another organism.
D. is artificially cultured and harvested.

92. Which of the following explains how biology takes part in biosensor technology? Using microorganism to

A

A. monitor pollutants
B. develop vaccines
C. extract metals from ores
D. produce antibiotics

93. In a textile industry, microorganism's commercial products play a significant role in removing stains like grease by changing

D

A. the acidic or basic nature of the stain molecules.
B. the temperature of insoluble large stain molecules.
C. the color of stain molecules to another color.
D. large insoluble stain molecules into small and soluble ones.

94. Which one of the following statements is correct about application of bio-pesticide in agriculture? It

A

A. uses bacteria and fungi or their metabolites to kill insects.
B. breakdowns glyphosate by an enzyme introduced into plant cell culture.
C. produces insect resistant crops through modification of the plant genes using bacterial plasmids.
D. produces toxic chemicals by crops through modification of their genes.

95. Which one of the following statements correctly describes bacteria? They are

B

A. multicellular eukaryotic organisms.
B. single celled prokaryotic organisms.
C. single celled eukaryotic organisms.
D. multicellular prokaryotic organisms.

96. Which one among the following processes occurs during the light independent phase of photosynthesis?

D

A. Cyclic photophosphorylation of ADP in the thylakoid
B. Excitation of electrons from chlorophyll molecules
C. Splitting of water molecules into its components
D. Reduction of triose molecules by hydrogen from NADPH

97. As compared to non- cyclic photophosphorylation, the cyclic photophosphorylation uses the

A

A. photosystem I as the last electron acceptor.
B. photosystem I to produce ATP and reduced NADP in the stroma.
C. hydrolysis of water to replace electrons lost from photosystem II.
D. photosystem II as the first electron donor to NADP.

98. Which one of the following chemical reactions summarizes the process of photosynthesis?

D

A. $C_5H_{10}O_5 + 6O_2 \rightarrow 6CO_2 + 12O_2 + 12H_2O$
B. $6CO_2 + 6H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + ATP$
C. $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$
D. $6CO_2 + 12H_2O \rightarrow C_6H_{12}O_6 + 6O_2 + 6H_2O$

99. Which one of the following statements properly describes the structure of ATP? It is made up of

A

A. one adenine base attached to a pentose sugar and three phosphate groups.
B. two adenine bases attached to a hexose sugar and three phosphate groups.
C. two adenine bases attached to a deoxyribose sugar and two phosphate groups.
D. one adenine base attached to a ribose sugar and two phosphate groups.

100. Which one of the following descriptions about glycolysis is correct? It is a process

C

A. of producing acetyl CoA from pyruvate by releasing CO_2.
B. that produces a net of 4 ATP through substrate level phosphorylation.
C. of breaking down of a glucose molecule to two pyruvates.
D. that takes place in the cytosol with high demand of oxygen.

answer provided by @ethiomatric

THE END