# EDUCATIONAL ASSESSMENT AND EXAMINATIONS SERVICE
# ETHIOPIAN SECONDARY SCHOOL LEAVING CERTIFICATE EXAMINATION (ESSLCE)
## BIOLOGY, TIKIMT 2014/15 (OCTOBER 2022)

**BOOKLET CODE: 154** **SUBJECT CODE: 06**

**TIME ALLOWED: 2 HOURS**

**GENERAL DIRECTIONS**

**THIS** BOOKLET CONTAINS **BIOLOGY** EXAMINATION. **THE** CODE FOR **THIS** SUBJECT IS **06** AND THE CODE FOR THIS PARTICULAR BOOKLET **IS 154**. PLEASE COPY THESE CODES ON YOUR ANSWER SHEET WHERE **IT READSSUBJECT CODE AND BOOKLET CODE**.

**IN** THIS EXAMINATION, THERE ARE A TOTAL OF **100 MULTIPLE CHOICE QUESTIONS**. CAREFULLY SELECT THE BEST ANSWER AND **BLACKEN** ONLY THE LETTER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET PROVIDED. FOLLOW THE INSTRUCTIONS ON THE ANSWER SHEET AND THE EXAMINATION PAPER CAREFULLY. USE **ONLY PENCIL** TO MARK YOUR ANSWERS. YOUR ANSWER MARK **SHOULD BE HEAVY AND DARK**, COVERING THE ANSWER SPACE **COMPLETELY**. PLEASE ERASE ALL UNNECESSARY MARKS **COMPLETELY** INCLUDING ANSWERS YOU HAVE CHANGED FROM **YOUR** ANSWER SHEET.

**YOU** ARE ALLOWED TO WORK ON THE EXAM FOR **2 HOURS**. WHEN **TIME** IS CALLED, YOU MUST IMMEDIATELY STOP WORKING, PUT **YOUR** PENCIL DOWN, AND WAIT FOR FUTURE INSTRUCTIONS.

**ANY** FORM OF CHEATING OR AN ATTEMPT TO CHEAT IN THE **EXAMINATION** WILL RESULT IN AN AUTOMATIC DISMISSAL FROM **THE** EXAMINATION HALL AND CANCELLATION OF YOUR SCORE(S).

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1. Bacterial cell wall is unique due to its
   A. chemical composition.
   B. freely permeability.
   C. selective permeability.
   D. mechanical support.

2. Which genus of bacteria oxidize hydrogen sulphide to sulphate and make sulphate ions available to be taken by plant roots from the soil?
   A. *Klebsiella*
   B. *Desulphovibrio*.
   C. *Azotobacter*
   D. *Thiobacillus*

3. Which one of the following diseases is caused by food poisoning bacteria?
   A. *Candidiasis*
   B. *Salmonellosis*
   C. *Tuberculosis*
   D. *Pneumonia*

4. Which one of the following is correct concerning the reproductive cycles of viruses?
   A. Both lytic and lysogenic life cycles release new viruses without the genetic alteration of the host cell.
   B. In lysogenic life cycle the DNA of the virus integrates with the host cell's DNA.
   C. Both lytic and lysogenic life cycles undergo the same life cycle but ending with different results.
   D. In lytic life cycle, viruses are released without killing the host cell.

5. Unlike free living cells, viruses are completely
   A. pathogenic to a living cell.
   B. mutual to a living cell.
   C. parasitic to a living cell.
   D. harmful to a living cell.

6. Why are vaccines important? Because they help to
   A. trigger the immune system.
   B. kill pathogens.
   C. prevent functional diseases.
   D. heal wounds.

7. Assume you wanted to demonstrate compatibility of blood groups. You took four test tubes labeled O, A, B, and AB based on the blood group that each test tube contains. Then you added unknown blood sample into each test tube and no agglutination was observed in each test tube. From this, you can conclude that the unknown blood sample was
   A. blood group B.
   B blood group O.
   C. blood group A.
   D. blood group AB.

8. Which one of the following diseases increases the likelihood of contracting HIV?
   A. Syphilis
   B. Chancroid
   C. Tuberculosis
   D. Gonorrhoea

9. Even though pasteurization is a technique used to heat milk, beer and other foods, it cannot preserve food unspoiled for years because it
   A. cannot kill pathogenic microorganisms.
   B. reduces the nutritional content of the food.
   C. is conducted in containers that are not properly sealed.
   D. uses mild temperature that kills most but not all bacteria.

10. Which one of the following statements is correct about the binomial nomenclature?
   A. The genus name is written in full while the species name is abbreviated.
   B. Both genus and species names are capitalized and italicized when printed.
   C. The first letter of genus name is capitalized while the species name is written in small letters.
   D. The genus name is written in English while the species name is written in Latin.

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11. During gas exchange between the alveoli and blood capillaries, oxygen is absorbed by the blood while carbon dioxide is removed. This opposite direction of gas exchange occurs due to
A. difference in the concentration gradient of oxygen and carbon dioxide.
B. difference in the molecular size of oxygen and carbon dioxide.
C. thicker layer of the capillaries.
D. the small surface area of the alveoli.

12. Identify the correct statement about the effect of exercise on breathing rate.
A. The vital capacity of the lungs decrease during heavy exercise.
B. The tidal volume of air at rest is greater than the tidal volume of air during exercise.
C. Fast and deep breathing are the result of demanding less oxygen.
D. Exercise and getting fit makes the lungs efficient.

13. The following is a list of functions of the components of blood.
1. Transport of oxygen
2. Fight against diseases
3. Cause blood clotting
Which one of the following is a correct order of blood components responsible for the above functions respectively?
A. White blood cells, platelets, red blood cells
B. Platelets, white blood cells, red blood cells
C. Red blood cells, white blood cells, platelets
D. Red blood cells, platelets, white blood cells

14. What is the cause of the back flow of blood into the atria from the ventricles? It could be damage of the
A. aorta.
B. pulmonary artery.
C. pulmonary vein.
D. valves.

15. The capillaries are blood vessels that have thin wall and large surface area since their function is
A. transport of oxygenated blood.
B. exchange of substances.
C. to return blood to the heart.
D. transport of deoxygenated blood.

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16. During image formation, light is refracted twice before it is focused on the retina. This phenomenon happens at the
A. aqueous humour and lens.
B. iris and lens.
C. lens and vitrous humour.
D. cornea and lens.

17. Three students designed the following experimental settings to understand the actual taste of a food.
Student 1: Blind folded two students, one of them tightly holding the nose while the other without holding the nose and tasting the food.
Student 2: Blind folded one student and the other left with open eyes, both holding their nose tightly while tasting the food.
Student 3: None of the participants blind folded and only one of them holding her nose tightly while tasting the food.
Student 4: None of the participants blind folded and both of them taste the food without holding the nose.
Which student designed the most appropriate experiment?
A. Student 1
B. Student 2
C. Student 4
D. Student 3

18. Short sightedness is corrected by a concave lens because the problem arises due to a
A. weak eye lens that converges light slightly.
B. powerful eye lens that diverges light.
C. weak eye lens that diverges light.
D. strong eye lens that converges light too soon.

19. A patient exhibited symptoms of weight loss, sweating, and irritability and the doctor suspected an endocrine malfunction that can be related to the
A. pancreas.
B. adrenal gland.
C. thyroid gland.
D. gonads.

20. Secretions of endocrine glands require receptors on cell membrane to be picked by their targets while exocrine secretions do not. This is because
A. exocrine glands secrete hormone directly to the blood stream.
B. endocrine glands are ductless.
C. exocrine glands are controlled by the nervous system.
D. endocrine glands produce protein-based hormones.

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21. Which of the following diseases is caused by a DNA virus?
A. Cold sore
B. AIDS
C. Swine flu
D. Corona

22. Currently, natural resources are being depleted at increasing rate and waste materials are accumulated and discharged freely into water bodies. What is the best strategy to overcome these problems?
A. Decomposition
B. Succession
C. Fossilization
D. Recycling

23. Which stage of the nitrogen cycle needs the role of Rhizobium?
A. Decomposition
B. Denitrification
C. Nitrogen fixation
D. Nitrification

24. A key aspect in the process of recovery of an ecosystem through succession is that
A. pioneer species always make the environment better.
B. higher organisms colonize the environment first.
C. a climax community of lichens and mosses is established at the end.
D. pioneer species always tend to be lower animals.

25. What are the common plants of the boreal forest?
A. Deciduous trees
B. Conifers
C. Mosses
D. Epiphytes

26. Which one of the following may **NOT** be regulated by a plant hormone?
A. Seed dispersal
B. Cell division
C. Cell elongation
D. Fruit ripening

27. Bushing of a plant results from
A. cancellation of the positive effect of apical dominance.
B. removal of the inhibitory effect of auxin.
C. decreased production of auxin by side shoots.
D. increased production of auxin by the main shoot.

28. Actions such as protection of individual species, reduction of pollution, and reduction of deforestation can collectively be taken as methods of
A. agricultural expansion.
B. biodiversity conservation.
C. fighting global warming.
D. fighting soil erosion.

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29. Which one of the following plants is **NOT** endemic to Ethiopia?
A. Mango
B. Zigba
C. Noug
D. Enset

30. Which one of the following national parks is characterized by the presence of wildlife such as elephant, lion, cheetah and giraffe?
A. Bale mountains national park
B. Awash national park
C. Mago national park
D. Simien mountains national park

31. In kingdom animalia, which phylum poisons its prey by tentacles that contain stinging cells?
A. Nematoda
B. Coelenterata
C. Annelida
D. Porifera

32. Mosses are grouped under division bryophyta because they
A. lack true root system and vascular tissue.
B. have true leaves, stems and roots.
C. have flat and broad leaves.
D. are evergreen and photosynthesize all year round.

33. If you are asked to draw a pyramid of biomass of an aquatic habitat that contains zooplanktons, herrings, sea lions and phytoplankton, which organisms should be placed at the top of the pyramid?
A. Phytoplankton
B. Zooplanktons
C. Herrings
D. Sea lions

34. Which one of the following is an adaptation to reduce water loss in plants? Having
A. a single layered epidermis in leaves
B. thin broad leaves
C. large and wide stomata
D. leaves covered with waxy cuticle

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35. Why are arctic animals such as seals, walruses and whales large in body size? To
A. reduce heat loss
B. move in the water bodies easily
C. capture their prey without challenges
D. increase their surface area

36. The institute of biodiversity conservation is one of the biological research institutes of Ethiopia attempting to conserve the genetic resources of the country. As such, the institute's major research efforts focus on all of the following **EXCEPT**
A. microorganism conservation.
B. animal conservation.
C. soil conservation.
D. plant conservation.

37. The importance of stains in microscopic investigations is explained by their effect in
A. increasing resolution.
B. creating contrast.
C. increasing magnification.
D. decreasing air bubbles.

38. One of the following problems can occur if the liver does **NOT** properly carry out its digestive functions.
A. Increased alkalinity of the intestine
B. Incomplete digestion of polysaccharides
C. Partial absorption of digested foods
D. Partial digestion of fats

39. Which of the following is the correct order of food substance, enzyme, and breakdown product of the digestive process in the stomach respectively?
A. Starch, lipase, glucose
B. Fat, trypsin, glycerol
C. Protein, pepsin, amino acid
D. Lipid, amylase, fatty acid

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40. Assume you are trying to demonstrate breathing movements using artificial lung and you pulled down the rubber sheet. This action of pulling represents which step of the actual breathing process?
A. Exhalation and contraction of the diaphragm
B. Inhalation and relaxation of the diaphragm
C. Inhalation and contraction of the diaphragm
D. Exhalation and relaxation of the diaphragm

41. When three fatty acid molecules and a glycerol molecule undergo condensation reaction, they form
A. peptide bond and protein.
B. ester bond and triglyceride.
C. glycosidic bond and polysaccharide.
D. phosphate bond and phospholipid.

42. In water, phospholipids become organized into a bilayer. In this configuration, which part of the bilayer faces towards the water?
A. Hydrocarbon tail
B. Fatty acid tail
C. Phosphate head
D. Glycerol head

43. Four students wanted to conduct chemical tests on unknown food particles and used the following chemicals and materials.
Student A: Test tubes and biuret solution
Student B: Test tubes, ethanol, water, filter paper
Student C: Test tubes, benedict's solution, water bath
Student D: Test tubes and iodine solution
Which of the above students planed a test for lipids?
A. Student B
B. Student D
C. Student C
D. Student A

44. Niacin is used to make the coenzyme
A. FAD.
B. ADP.
C. NAD.
D. AMP.

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45. The following are reaction types catalyzed by different classes of enzymes.
1. Transfering hydrogen and oxygen atoms
2. Changing of the molecular form of the substrate
3. Joining of two molecules by the formation of new bonds

Which classes of enzymes catalyze the above reactions according to their consecutive order?
A. Transferases, hydrolases, lyases
B. Oxidoreductases, isomerases, ligases
C. Oxidoreductases, hydrolases, lyases
D. Transferases, isomerases, ligases

46. The hydrogen ions that used to turn the rotor of ATP synthase come from
A. phosphorylation of ADP.
B. oxidation of NADH and $FADH_2$.
C. hydrolysis of ATP.
D. reduction of NADH and $FADH_2$.

47. What triggers fermentation during exercise?
A. Shortage of oxygen
B. Over activity of respiratory enzymes
C. Production of ATP beyond the cells demand
D. Presence of excess glucose

48. Which of the following processes explains lactate production during anaerobic respiration in animal cells?
A. Oxidation of pyruvate
B. Decarboxylation of pyruvate
C. Phosphorylation of pyruvate
D. Reduction of pyruvate

49. Which one of the following descriptions holds true for the link reaction of respiration?
A. Pyruvate reacts with coenzyme A to form acetyl coenzyme A.
B. Glucose is converted to pyruvate through a chain of reactions.
C. Hydrogen ion and ATP are synthesized.
D. Reduced NAD and reduced FAD are produced.

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50. Which one of the following is the neo-Darwinian idea of evolution? Evolutionary changes occur due to
A. inheritance of acquired characteristics.
B. natural selection through genetics and behavior.
C. use and disuse of anatomical structures.
D. competitions between living organisms.

51. What is the significance of *Australopithecus afarensis* in the study of human evolution? To confirm
A. evolution of bipedalism before large brains
B. divergent evolution of *Homo erectus* from *Homo habilis*
C. true common ancestor of chimpanzees and humans
D. convergent evolution of *Homo neanderthalensis* and *Homo erectus*

52. Instinctive behavior
A. is common to all members of a species.
B. varies from individual to individual.
C. may be modified by new experiences.
D. develops through trial and error.

53. Which one of the following statements is an example of latent learning?
A. The random movement of woodlice in response to changes in light intensity and humidity.
B. Knowledge of a mice about the immediate environment of its burrow may help it escape from predator.
C. Foraging bees returning from successful trip dance on the honey comb to recruit others to harvest a new.
D. Female baboon turns its buttock toward the dominant male to signify readiness to mate.

54. Which one of the following is correct about the action of apoenzymes and coenzymes?
A. Coenzymes bind with cofactors to form an active enzyme.
B. Apoenzymes bind with enzymes to give catalytic activity.
C. Both apoenzymes and coenzymes combine with cofactors to form a non-active enzyme.
D. Coenzymes bind with enzymes to give catalytic activity.

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55. Consider the following statements.
I. Genetically determined and common to all members of a species.
II. The behavior may be modified by new experiences.
III. Behavior is fully functional at the first attempt.
IV. Generally there is no modification of the behavior.
Which numbers describe innate and learned behaviors?
A. Innate: III, IV and Learned: I, II
B. Innate: I, II and learned: III, IV
C. Innate: II, III, IV and Learned: I
D. Innate: I, III, IV and Learned: II

56. Which one of the following is an example of social behavior?
A. Exaggeration of size by fluffing up of feathers
B. Singing of frogs on spring nights
C. Marking a territory with urine
D. Caring for offspring that are not one's own

57. Consider the following reaction.
Reactant A + Reactant B + Enzyme → Intermediate → Product AB + Enzyme?
At which point are the chemical bonds weakened? At the
A. intermediate
B. reactant A
C. reactant B
D. product AB

58. How do enzymes bind and act on their substrates? By using the
A. lock-and-key model and reducing energy of the substrate
B. induced-fit model and providing extra energy for the substrate
C. lock-and-key model and changing themselves into products
D. induced-fit model and putting the substrates under tension

59. Which of the following external factors influence the turnover rate of enzymes by completely damaging their tertiary structure?
A. Competitive inhibitors
B. Substrate concentration
C. Reversible inhibitors
D. Temperature and pH

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60. During baking of injera, the $CO_2$ produced by yeast is used to
A. kill contaminants that spoil injera.
B. give injera its typical texture.
C. bake injera with low temperature.
D. increase the shelf life of injera.

61. The nerve impulse is transmitted from one neuron to another by a neurotransmitter at the
A. axon.
B. cell body.
C. synapse.
D. myelin sheath.

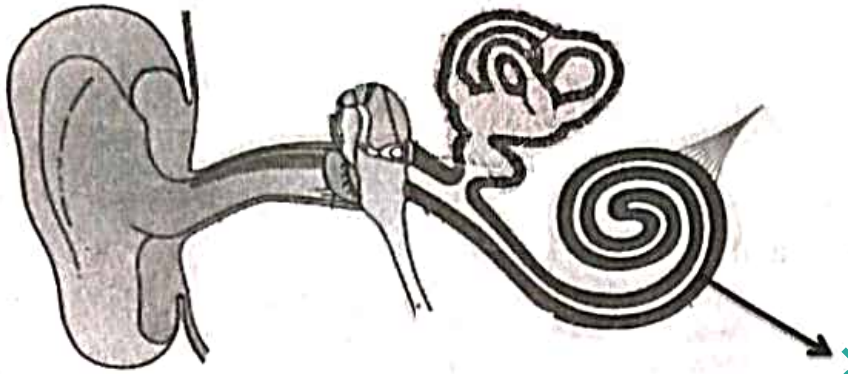
62. What happens if the axon is stimulated? Formation of
A. negative charge in both sides of the axon
B. negative charge inside the axon
C. positive charge inside the axon
D. positive charge outside of the axon

63. Assume you wanted to demonstrate a simple reflex action using the knee jerk reflex. You asked a friend to sit with one leg crossed over the other. Which one of the following indicates the correct demonstration?
A. Pulling down your friend's leg that is followed by downward movement
B. Hitting your friend on the toes followed by sudden upward movement of the leg
C. Bending up your friend's leg followed by downward movement of the leg
D. Hitting your friend below the knee cap followed by a sudden upward movement

64. A finch with an average length beak was not able to obtain insects out of the cracks in the bark of trees as well as one with a longer beak. It was also not able to crush seeds as well as one with a shorter beak. Over time, those with the longer beaks and those with the shorter beaks increased in numbers, while those with average length beaks decreased in number. Which type of selection has been operated in this scenario?
A. Disruptive
B. Directional
C. Behavioral
D. Stabilising

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65. This item is based on the following diagram of the human ear.




What is the name of the human ear part represented by letter 'F' in the above diagram?

A. Semicircular canal
B. Sacculus
C. Utriculus
D. Cochlea

66. The cell theory states that cells

A. contain different organelles with no specialization.
B. have basically different composition.
C. come from pre-existing cells by division.
D. come from non-living objects.

67. Which type of chromosome mutation causes leukemia?

A. Duplication
B. Insertion
C. Inversion
D. Deletion

68. Which theory of the origin of life states that life has no beginning or ending?

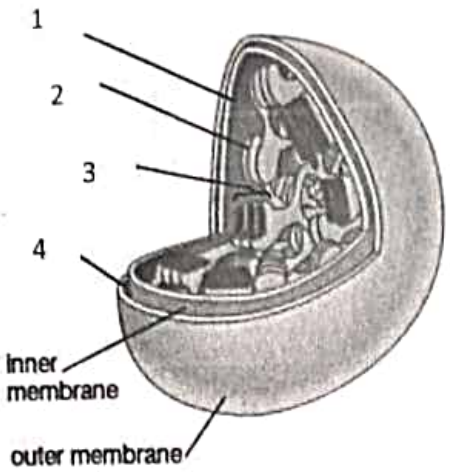
A. Cosmozoan theory
B. Special creationism
C. Eternity theory
D. Biochemical theory

69. Which one of the following is paleontological evidence of evolution?

A. The presence of homologous structures in living organisms
B. Traces of organisms from the remote past
C. Similarities in the DNA base sequences of different organisms
D. Similarities in the development of embryos in different organisms

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70. This item is based on the diagram of a chloroplast given below.




In the above diagram of the chloroplast, what are the sites of the light-dependent and light-independent reactions of photosynthesis respectively?

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

71. A colour blind daughter can be born when the
A. mother is colour blind and the father is normal.
B. father is colour blind and the mother is normal.
C. mother is carrier and the father is colour blind.
D. father is normal and the mother is carrier.

72. A farmer cut off several regions of a stem near to the buds of a plant. He removed some of the leaves and dipped the cuts end in some hormones rooting powder and planted the cuttings in a compost. He kept the cuttings well watered and within a few weeks they developed their own root system and became new independent plants. Which one of the following is correct about this experiment? The new plants are most probably
A. phenotypically and genotypically different from the parent plant and from each other.
B. genetically and phenotypically identical to the parent plant and to each other.
C. genotypically identical but phenotypically different from the parent.
D. phenotypically identical but genetically different from each other.

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73. During DNA replication
A. DNA helicase transports nucleotides that are used to build the new DNA.
B. the base sequence in the new DNA will be slightly changed from the parent DNA.
C. DNA polymerase assembles new nucleotides into a new strand.
D. the parent DNA will become different from the daughter DNA.

74. With four different bases to work with, there are 64 possible triplet codes, but only 20 amino acids are used to make all the different proteins. This is because the DNA code is
A. degenerate code.
B. non-overlapping code.
C. semi conservative code.
D. universal code.

75. If mRNA brings the code "UGA" into the ribosome
A. translation ceases and protein synthesis terminates.
B. tRNA will bring the amino acid methionine.
C. ribosome will initiate protein synthesis.
D. tRNA will bring "UGA" anticodon.

76. Breakdown of the thick spongy wall of the uterus at the end of the menstrual cycle is associated with the
A. formation of the corpus luteum.
B. maturation of the follicle.
C. decrease in progesterone and estrogen concentration.
D. increase in oestrogen and progesterone concentration.

77. The first incubation period of HIV is characterized by a duration of
A. 20 years before all the symptoms appear in well-nourished people.
B. 2 weeks to produce enough antibodies.
C. 3-12 weeks when mild symptoms are manifested.
D. 2-3 years for the progress of infection to AIDS.

78. Which one of the following is a behavioral method of temperature regulation in homoiotherms?
A. Piloerection
B. Licking
C. Aestivation
D. Vasodilation

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79. What will happen if the water content of the blood is too high?
A. The second coiled tubule of the kidney becomes more permeable.
B. Antidiuretic hormone secretion decreases.
C. Osmoreceptors stimulate pituitary gland to release ADH.
D. The kidney reabsorbs more water back into the blood.

80. The movement of water from the roots up to the top leaves of tall trees is carried out by
A. loss of water by transpiration and its replacement by osmosis.
B. active transport in the roots and osmosis in the leaves.
C. the low cohesive and adhesive forces of water in the xylem.
D. active transport in both the roots and leaves.

81. From the following options, which one contains the steps of writing a scientific report in the correct order?
A. Title → Prediction → Hypothesis → Procedure → Evaluation → Conclusion → Results → Acknowledgement
B. Title → Hypothesis → Prediction → Procedure → Results → Conclusion → Evaluation → Acknowledgement
C. Title → Hypothesis → Prediction → Evaluation → Results → Procedure → Conclusion → Acknowledgement
D. Title → Hypothesis → Procedure → Prediction → Results → Conclusion → Evaluation → Acknowledgement

82. What type of force is responsible if a stool solution is placed in a centrifuge, spins the tube at high speed and the solid particles are forced to settle down at the bottom?
A. Cohesive force
B. Adhesive force
C. Centripetal force
D. Gravitational force

83. Ten percent of attendants of a wedding ceremony were sick just after having lunch at the ceremony. What should a student do first to prove scientifically that the sickness was actually linked to the food eaten at the ceremony? She should
A. give drugs to the sick individuals before they contaminate others.
B. take food sample to a laboratory and analyze the presence of toxin.
C. ask herself why ten percent of the attendants were sicked.
D. take stool sample of the sick individuals and analyze the presence of toxins.

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84. Which one of the following importance of water is directly related with its ideal viscosity?
A. Transport medium
B. Habitat for aquatic animals
C. Reactant in photosynthesis
D. Reaction medium

85. Which property of water prevents ponds from drying during the long dry season? High
A. viscosity property
B. latent heat of vaporization
C. transparent ability
D. surface tension

86. The following table compares prokaryotes and eukaryotes.

| Feature | Prokaryotes | Eukaryotes |
|---|---|---|
| DNA | X | Linear |
| Mitochondria | Absent | Y |
| Ribosomes | Present (70S) | Z |
| Cell membrane | Present | Present |

In the above table, X, Y, and Z can be respectively stated as
A. Linear, present, present (70S)
B. Circular, present, present (70S)
C. Linear, present, present (80S)
D. Circular, present, present (80S)

87. Which one of the following is **NOT** the function of the plasma membrane in eukaryotic cells?
A. Isolating the cell from the external environment
B. Transferring chemical energy from carbohydrates to ATP
C. Responding to external signals
D. Exchanging materials and information

88. Which one of the following is correct with respect to the structural components of the plasma membrane?
A. Integral proteins are found inserted in the lipid bilayer.
B. Peripheral proteins are located outside the lipid bilayer.
C. Channel proteins cover the outer layer of the lipid bilayer.
D. Glycoproteins are found on the cytoplasmic side of the cell membrane.

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94. Why *Drosophila melanogaster* are considered ideal for genetic experiments? Because they
A. contain chromosomes with several genes.
B. have the highest number of chromosomes.
C. breed and keep in large numbers easily.
D. complete their life cycle within one month.

95. Which one of the following statements best describes the mechanisms by which meiosis brings about variation? Variation in meiosis is because of
A. independent assortment and crossing over.
B. frequent spontaneous mutations.
C. variations in the content of the cytoplasm between the cells.
D. reduction division that leads to haploid cell formation.

96. In the tropical regions, where there is higher temperature, which one of the following is most likely to take place in the C3 plant's? Rubisco binds with
A. $CO_2$ to produce glucose and water.
B. $O_2$ to produce GP and phosphoglycolate.
C. GP to produce lipid.
D. $H_2O$ to produce TP.

97. During the light-independent reactions of photosynthesis
A. glucose is directly produced from GP.
B. RuBP reacts with $CO_2$ to directly form TP.
C. some of the GP is used to regenerate RuBP.
D. GP is reduced to TP by reduced NADP.

98. The suitability of the structural arrangement of a chloroplast in relation to its function can be indicated by the fact that
A. all pigments are floating around the solution of the stroma.
B. all pigments in the photosystem are linked to the electron transport chain.
C. carotenoids are used as a reaction center from which electrons are excited.
D. the different pigments absorb the same wavelength of light.

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99. Which one of the following events occurs during the day time in the CAM photosynthetic pathway?
A. $CO_2$ reacts with malate.
B. The stomata open to allow $CO_2$.
C. $CO_2$ enters into Calvin cycle.
D. Oxaloacetate is formed.

100. How many turns of the light independent reaction cycle are required to make one molecule of triose phosphate?
A. 3
B. 2
C. 6
D. 4

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THE END