HAWAS SECONDARY SCHOOL BIOLOGY WORKSHEET FOR GRADE 12, 2016

1. Which of the following plants uses CAM photosynthesis?
   A. Sugarcane B. Sorghum C. Maize D. cactus
2. Which of the following stages of photosynthesis can take place I the dark?
   A. Photolysis of water B. photo system I C. Photo system II D. Calvin cy
3. Which of the following groups are believed to be the first photosynthetic organisms
to evolve on Earth?
   A. Green plants B. Green algae C. Blue green algae D. Lichens
4. During alcohol fermentation, pyruvic and in the presence of pyruvate decarboxylase is first converted to _____
   A. glucose B. lactose C. lactic acid D. acetaldehyde
5. The conversion of one molecule of glucose to two molecules of pyruvate resul
the net formation of:-
   A. two molecules of ATP C. three molecules of ATP
   B. Six molecules of water D. thirty- eight molecules of ATP
6. Anaerobic metabolism refers to the generation of ATP:
   A. Without the involvement of ADP C. without the use of oxygen
   B. Without the use of glycogen D. by the conversion of pyruvate to lacta
7. Glycolysis occurs in the _____?
   A. Cytoplasm B. Mitochondria C. Nucleus D. Chloroplast
8. During the krebs cycle, to which of the following molecules is most of the ene
released from food transferred?
   A. ATP B. NAD C. ADP D. AMP
9. During which stage of aerobic respiration does oxidative phosphorylation
   A. Glycolysis B. Krebs cycle C. Link reaction D. Chemiosmosis
10. During anaerobic respiration, what is the gross number of ATP molecules t
are produce per glucose molecule?
   A. Two B. Three D. Four D. Six
11. For which of the following processes is ATP **NOT** required?
   A. Diffusion of oxygen into cells
   B. Synthesis of molecules
   C. Active transport of molecules from one site to another

D. Muscle contraction

12. What is the molecule in plant cells that first captures the radiant energy fr sunlight?

A. ATP B. DNA C. Chlorophyll D. Carbon dioxide

13. From which of the following does the O_2 released during the process of photosynthesis originate?

A. Pyruvic acid B. CO_2 C. Sugar D. Water

14. What happens in the first reaction of the Krebs cycle during energy transformation?

A. A 2-C compound is produced C. A 4-C compound is produced

B. A 6- C compound is produced D. A 5-C compound is produced

15. Under what condition do C4 plants have more photosynthetic efficiency th plants?

A. Low water supply B. Low temperature

C. Low light intensity D. Low CO_2 concentration

16. Which of the following processes releases CO_2 into the atmosphere?

A. Respiration B. Assimilation C. Feeding D. Photosynthesis

17. During which of the following processes in cellular respiration are most of ATPs formed?

A. Glycolysis B. Chemiosmosis C. Link reaction D. Krebs cycle

18. Which of the following is the adaptaptation by C4 plants that helps them to avoid photorespiration?

A. Harvesting of carbon dioxide at night

B. Using separate cells for light & dark reactions

C. Storing carbon dioxide in the vacuole

D. Keeping the stomata closed during the day

19. Which of the following substances is NOT formed when glucose is ferment yeasts?

A. Alcohol B. ATP C. Lactic acid D. Carbon dioxide

20. What is the advantage that a photo system containing molecules of differe types of light sensitive pigments have?

A. To absorb light of different wave lengths

B. To increase the size of the photosystem

C. To increase the complexity of the photosystem
D. To increase the surface area for light absorption

21. Which of the following is an important way by which green plants mitigate greenhouse effect?
A. Use of fire wood to replace coal C. releasing water to the atmosphere
B. Removing CO_2 from the atmosphere D. Releasing oxygen to the atmosphere

22. Which phosphate bond of the ATP is broken when the energy it contains is needed for cellular activity?
A. The first bond B. The C- C bond C. The second bond D. The third bond

23. What is the molecule that supplies the quickest and suitable source of energy to cells?
A. Lactose B. Sucrose C. ATP D. Lipid

24. Which of the following is NOT true about mitochondria and chloroplast?
A. Both contain chlorophyll C. Both have double membrane
B. Both contain nucleic acid D. Both transducer energy

25. Which one of the following processes has a decreasing effect on the concentration of atmospheric carbon dioxide?
A. Cellular respiration C. Decomposition of dead organisms
B. Combustion of fossil fuels D. photosynthesis

26. In which industrial products is pyruvate fermentation by yeast practically applied?
A. Brewing beer B. Swiss cheese making
C. production of vinegar D. yoghurt making

27. When athletes take part in short distance running, how do the cells generate most of the energy that is quickly needed?
A. Aerobic respiration in muscle cells C. Anaerobic respiration in muscle cells

B. Mitochondrial respiration in any cell D. Yeast fermentation in the stomach

28. Cells immediately use the energy that electrons lose as they pass along the chain of electron carriers to:-

A. Produce ATP B. pump protons

C. spin the rotor of ATP synthase D. reduce NAD

29. Which of the following happens in both cyclic and non- cyclic photophosphorilation?

A. ATP is formed B. Oxygen is generated

C. NADP is reduced D. water molecule splits

30. Which of the following is NOT true about C4 plants such as tef (*Eragrostis tef*)?

A. CO2 is harvested during the night time
B. The bundle sheath cells contain chloroplasts
C. Light- dependent reaction occurs in mesophyll cells
D. Chloroplasts of bundle sheath sheath cells lack thylakoids

31. What does the fermentation of glucose by yeast normally yield?

A. Lactic acid, CO2 and 2 ATP C. Alcohol, CO2, and 2 ATP
B. CO2, H2O, and 36 ATP D. Alcohol, CO2, and 36ATP

32. What is the purpose of the infoldings of the inner- membrane of the mitochondrion?

A. Increasing the photosynthetic capacity of the cell
B. Speeding up the loss of CO2 during fermentation
C. Speeding up the process of glycolysis
D. Increasing the surface area for ATP production

33. How many net ATP molecules are generated through anaerobic respiration, when a single glucose molecule is changed to pyruvate in the human body?

A. Two B. Three C. Four D. Six

34. During the Krebs cycle, which of the following molecules temporarily stores most

of the energy released from food molecule?

A. ADP B. ATP C. NADH D. FADH

35. At which stage is most of the ATP generated in aerobic respiration?

A. Glycolysis B. Link reaction C. Krebs cycle D. Electron transport

36. Which of the following substances is NOT necessary for photosynthesis to take place?

A. Chlorophyll B. Carbon dioxide C. Oxygen D. Water

37. Where exactly in the cell does the Krebs cycle take place?

A. Mitochondrial matrix C. Cytoplasmic fluid

B. Inner mitochondrial membrane D. Outer mitochondrial membrane

38. The molecule of which pigment is located at the reaction center of a photosystem?

A. Chlorophyll a B. Chlorophyll b C. Carotenoid D. Accessory pigments

39. In which of the following ways is the carbon dioxide of the atmosphere fixed into the carbon found in organic molecules?

A. In the breathing processes of all animals

B. In the decomposition of organic molecules

C. In the process of photosynthesis by green plants

D. In all the cellular respiration processes of organisms

40. Which of the following groups of plants carry out light dependent and light dependent reactions of photosynthesis in separate cells?

A. C- 3 plants B. C-4 plants C. CAM plants D. plants without chlorophyll

41. During aerobic respiration, what is the route through which protons return from the mitochondrial inter-membrane space back to its matrix?

A. Proton pump B. ATP synthase C. Ion channel D. Membrane lipid

42. From which of the processes of cellular respiration is the majority of the ATP generated?

A. Anaerobic fermentation
B. Glycolysis & link reaction
C. Electron transport & chemiosmosis
D. Krebs cycle & glycolysis

43. During chemiosmosis, what substance diffuses from one side to the other side of the membrane?

A. Water molecules B. Protons C. Electrons D. ATP molecules

44. Which of the following is **NOT** true about photosystem- II?

A. Its reaction center molecule is P680
B. It passes its excited electrons to photosystem- I
C. The energy lost from its excited electrons reduces NADP
D. It replenishes its lost electrons from photolysis of water

45. What is the importance of chemiosmosis in photosynthesis and cellular respiration

A. Splitting of water molecule
B. Operating the proton pump
C. Combining hydrogen and carbon
D. Synthesizing ATP

46. Where does the light dependent reaction of photosynthesis occur in the chloroplast?

A. In the thylakoid membrane
B. In the fluid of the stroma
C. In all parts of the chloroplast
D. In the stomatal opening

47. For which of the following is the sugar produced by photosynthesis **NOT** used?

A. To produce biomass
B. To make new DNA
C. To produce ATP in respiration
D. To produce enzymes

48. In which process in ATP generated during short distance high speed running?

A. Aerobic respiration B. Mitochondrial energy transformation
C. Anaerobic respiration D. The Krebs cycle

49. When the muscle cells are in short supply of oxygen, which of the following compounds would be accumulated in them?

A. Ethanol B. Acetic acid C. lactic acid D. carbon dioxide

50. Which of the following processes of photosynthesis does **NOT** require the presence of light to take place?

A. The splitting of water B. ATP formation C. Reduction of NADP D. carbon fixation

51. Which of the following is NOT one of the stages in cellular respiration?

A. Calvin cycle B. Glycolysis C. Electron transport D. Krebs cycle

52. What is the correct equation for cellular respiration?

A. $6CO_2 + 6H_2O + \text{energy} \rightarrow 6O_2 + C_6H_{12}O_6$

B. $6O_2 + C_6H_{12}O_6 + 6CO_2 \rightarrow 6H_2O + \text{energy}$

C. $6O_2 + C_{12}H_{12}O_6 + \text{energy} \rightarrow 6CO_2 + 6H_2O$

D. $6CO_2 + 6H_2O + 6O_2 \rightarrow C6H12O6 + \text{energy}$

53. What amount of net gain in ATP does glycolysis provide to a cell?

A. 2 ATP molecules B. 4 ATP molecules C.18 ATP molecules D. 36 ATP molecules

54. How many moles of ATP will be generated as a result of oxidation of one mole of FADH2 in an actively respiring mitochondrion?

A. 0 B. 3 C. 2 D. 6

55. Which of the following is true for cellular respiration?

A. Restricted to plant cells C. occurs in all eukaryotic cells

B. Restricted to animal cells D. Occurs in prokaryotic cells only

56. In cyclic photophosphorylation, what is the source of the recycled electron?

A. Reduced NADP B. Chlorophyll molecule

C. Adenosine triphosphate D. Photolysis of water molecules

57. If there were no free oxygen to breathe, which one of the following steps of the

respiration process operate in our body?

A. Glycolysis B. Krebs cycle C. Electron transport chain D. The link reaction

58. What is the source of the oxygen that is produced during the process of photosynthesis by higher plants?

A. CO_2 B. H_2O C. ATP D. Chlorophyll

59. In aerobic respiration of cells, in which cellular part does the Krebs cycle (citric acid cycle take place?

A. Chloroplast B. Mitochondria C. Nuclei D. Lysosomes

60. What is the final electron acceptor in the electron transport chain of cellular respiration?

A. O_2 B. H_2 C. $NADP^+$ D. NAD^+

61. In an experiment to study photosynthesis. a plant was provided with radioactive carbon dioxide as a metabolic tracer and the radioactive carbon was incorporated first into oxaloacetate. Which one of the following would best characterize this plant?

A. C3 plant B. C4 plant C. CAM plant D. Heterotrophic plant

62. Which of the four stages in the aerobic respiration of glucose does NOT produce ATP?

A. Glycolysis B. Krebs cycle C. The link reaction D. Electron transport & chemiosmosis

63. Which of the following has the highest water potential than the other?

A. Pure liquid water B. Different solutions C. Animal cells D. Different suspensions

64. Which of the following results in the production of oxygen during photosynthesis?

A. Reducing NADP+ C. Electron transfer system of photosystem I

B. Electron transfer system of photosystem II D. splitting of the water molecules

65. Respiration is :

A. Anabolic and exergonic C. Anabolic and endergonic

B. Catabolic and exergonic D. Catabolic and endergonic

66. What is the ultimate source of the electrons that replace those lost from the photosystem II during photosynthesis?

A. Photosystem I B. Water C. Chlorophyll- a D. Chlorophyll-b

67. In which part of mitochondria does the Kreb's cycle take place?

A. In the inter- membrane space C. On the outer membrane surface

B. On the inner membrane surface D. In the matrix

68. How many ATP molecules are produced during the complete cellular respiration of one glucose molecule?

A. 2 B.4 C. 36 D. 18

69. The different steps for complete aerobic respiration are:m

A. Glycolysis and oxidative phosphorylation

B. Glycolysis and Krebs cycle

C. Krebs cycle and terminal oxidation

D. Glycolysis, Krebs cycle and terminal oxidation

70. Which of the following processes indicatethe process of photosynthesis?

A. Reductive. endergonic and anabolic C. Reductive, exergonic and anabolic

B. Reductive, endogenic and catabolic D. Reductive, exergonic and catabolic

71. Which of the following microorganism is brewer's yeast and baker's yeast?

A. Saccharomyces B. Candida C. Chlamydomonas D. plankton

72. Which of the following is not true about fungi

a. They have no true roots, leaves and stems C. Fungi are good example of decomposers

b. All fungi are saprobionts D. Yeast is unicellular fungi

73. A well-researched types of bacteria that have rod shape and importance of souring milk is;

a. Streptococcus B. Treponema palidom C. Lactobacillus D. borrelia

74. Gram's stain is called differential stain because:

a. It stains bacterial cell but not fungi C. it stains virus but not other organism
b. It stains some fungi cell purple and others pink D. It stains some bacteria purple and others pink

75. In the lysogenic cycle of virus reproduction:
a. The viral DNA become incorporated into the host cells DNA
b. When the host cell divides, copies of the viral DNA are passed to the daughter cell
c. Eventually the viral DNA becomes activated and causes the production of viral protein
d. All of the above

76. In pavlov's classical conditioning experiment on dogs, which one of the following is the conditioned response?
a. The salivation of the dog at the sound of the bell C. The sight of the food from far away
b. The salivation of the dog at the sight of food D. The sound of the bell before presenting food

77. A response to a stimulus that involves increased movement as the intensity of the stimulus increased is called: A. tropism B. taxes C. Kinesis D. None of the above

78. (a) Producing tear ☹ when dust gets in your eye, (b) Increasing breathing rate during exercise are:
a. Somatic reflex and autonomic reflex respectively C. autonomic and somatic reflex respectively
b. Orientational and instinctive respectively D. Instinctive and orientational respectively

79. Which of the following is orientational innate behavior
a. Nest building B. Taxes C. imprinting D. blinking your eye

80. Which of the following is not circannual rhythms in behavior
a. Migration B. hibernation C. Camouflage coloring D. none of the above

81. One teacher drives another every day. Then, one day, the driver is ill. The other teacher drives himself to school without getting lost. This type of learning is:
a. Latent B. Operant C. insight D imprinting

82. A male robin (spp. of bird) threatening an invader by using vocalization and by exaggerating its size. A younger male zebra also challenges the alder resident ♂ . this pattern of behavior is
a. Defending a territory B. social behavior C. Courtship behavior D all of the above
83. Which of the following is not a feature of eusociality?
a. The presence of several generations in the colony
b. Co-operative foraging
c. Co-operative caring for the young D. division od labor
84. In carbon cycle, which of the following processes remove CO2 from the atmosphere
a. Respirations B. Assimilation C. feeding D. Photosynthesis
85. What is the other name for the primary consumer of the ecosystem?
a. Predators B. Carnivores C. Green plants D. Herbivores
86. What percentage of the amount of carbon 14 originally present in a fossil would be left after its **fourth** half life? A. 75% B. 50% C. 25% D. 12.5%
87. According to the theory of evolution as proposed by Charles Darwin, which one of the following is the most important driving force of evolution?
a. Mutation B. Over-reproduction C. Genetic recombination D. Natural selection
88. In which of the following type of dominance, both extremes have a selective advantage compared with the mean and the two distinct types begin to emerge showing the extreme values of the original population?
a. Disruptive selection C. Artificial selection
b. Stabilizing selection D. Directional selection
89. The structure of a protein that describes the overall shape formed by several polypeptide chains which compose the protein.
a. Primary structure C. Secondary structure
b. Tertiary structure D. Quaternary structure
90. Which of the following is abiotic factors that influence how quickly a population of the same species or of a different species increases in size or decreases in size?
A. Predation B. Pathogens C. Temperature D. Competition

91. Which of the following is NOT true about importance of water? Water is a (an):
    A. essential requirement of respiration
    B. essential requirement of photosynthesis
    C. basis of all transport systems in organisms
    D. provides a means of removing excretory products
92. Which of the following is most diverse of all marine habitats?
    A. Coral reef B. Estuarine C. Wetlands D. Freshwater
93. A disease that is caused by a disease causing micro-organism infecting the body is called:
    A. Social diseases C. Infectious disease
    B. Genetic diseases D. Deficiency disease
94. Unknown enzyme was added into two test tubes. The first tube contained starch, the second one – sucrose. After 10 minutes incubation the solution in the first tube gives the positive result, in the second one – negative. What enzyme was added?
    A. Lipase B. Sucrase C. Amylase D. Lactase
95. Competitive inhibitors stop an enzyme from working by:
    A. changing the shape of the enzyme molecule
    B. binding with the substrate to form complex product
    C. combining with the end product of the biological reaction
    D. blocking the active site of the enzyme in a reversible manner
96. Which of the following is a feature found in BOTH prokaryotic and eukaryotic cells?
    A. Multiple linear chromosomes in each cell
    B. Ribosomes accomplish protein synthesis
    C. Extensive array of membrane bound nucleus
    D. Mitotic partition chromosomes into four cells
97. What make parts of the endoplasmic reticulum rough? The presence of….
    A. ribosomes organelles C. lipids in the membrane
    B. different amino acids D. proteins in the membrane
98. The method of gathering information by using your senses is called a/an_____
    A. Observation C. Prediction

B. Experiment D. Conclusion

99. Which of the following is NOT a principle of the cell theory?

A. Cells are the basic units of life C. Very few cells are able to reproduce

A. All living things are made of cells D. All cells comes from pre-existing cells

100. What is the correct order of steps in gram staining procedure?

a. Crystal violet, decolorisation, iodine treatment, safranin
b. Crystal violet, safranin, decolorisation, iodine treatment
c. Crystal violet, iodine treatment, decolorisationt, safranin
d. Crystal violet, decolorisation, safranin, iodine treatment

101. If someone suddenly removes his/her hand from a very hot object, which of the following types of behavior is manifested?

A. Reflex action B. Imprinting C. Learned behavior D. Sensitization

102. Which of the following pairs are ANALOGOUS structures?

A. The human arm and the front leg of a mule
B. The front leg of a frog and the wing of a bat
C. The wing of a bird and the wing of a butterfly
D. The wing of a bat and the wing of a bird

103. Animals without close evolutionary relations are sometimes seen to have similar structures adapted for the same function. Which evolutionary principle is illustrated by this observation?

A. Convergent evolution C. Sympatric evolution
B. Divergent evolution D. Allopatric evolution

104. Fossils over 60,000 years old are best dated by:

a. Carbon 14 dating B. stratigraphy C. potassium- argon dating D. none of the above

105. Which of the following descriptions is true about the action of selective pressures in populations? Selective pressure that acts:

A. Around the mean value is stabilizing C. Around the mean value is disruptive
B. At both ends of the distribution is directional D. At one ends of the distribution is stabilizing

106. Which of the following was the most possible mode of evolution by which the many species of Darwin's finches evolved on the Galapagos islands

A. Phyletic evolution C. Divergent evolution
B. convergent evolution D. sympatric evolution

107. Which of the following can be understood about living things from the study of how breeders improve domesticated plants and animals?

A. Living things tend to over- reproduce
B. Natural resources are of limited supply
C. Living things can be improved through selection
D. Individuals compete for resources

108. Which of the following is responsible for the bending of a young plant towards a unidirectional source of light?

A. Reduced photosynthesis on dark side
B. Faster growth rate on the dark side
C. Reduced auxin concentration on dark side
D. Increased rate of cell division on the light side

109. In his theory of evolution, the cause of which of the following concepts was MISSING in Darwin's explanation?

A. Over- reproduction C. Hereditary variation and ethology
B. Struggle for survival D. survival of the fittest

110. Function of the *Acetobacter* bacteria:

A. Treatment of Sewage C. Fermentation of Alcohol
B. Production of Vinegar D. Production of Antibiotic

111. Which of the following statements are NOT true about nitrogen-fixing bacteria? They

A. converts nitrogen gas into ammonium ions
B. are found in nodules on the roots of legumes
C. break down nitrate ions into ammonium ions
D. plays a vital role in the nitrogen cycle in nature

112. The only acellular micro-organism is:

A. Fungi B. Bacteria C. Viruses D. Protozoa

113. Which of the following are the most significant factors in determining biome type?

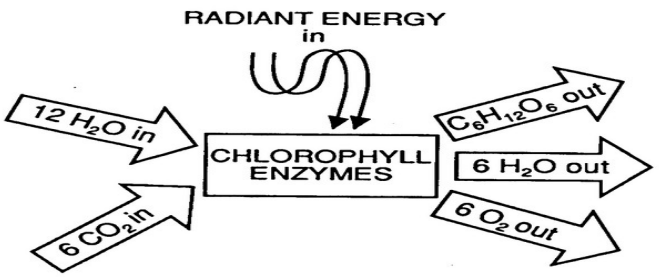
A. Soil type and soil depth C. Temperature and climates

B. Temperature and rainfall D. Climates and grazing animals

114. The light reactions occur in the _____ while the Calvin cycle occurs in the _____

a. cytosol of cytoplasm . . . stroma C. stroma . . . thylakoid membranes

b. thylakoid membranes . . . stroma D. cytoplasm . . . thylakoid



membrane

115. Which process does the diagram best illustrate?

a. Cellular digestion C. Yeast fermentation

b. Cellular respiration D. Plant photosynthesis

116. What does the fermentation of glucose by yeast normally yield?

C. Lactic acid, CO2 and 2 ATP C. Alcohol, CO2, and 2 ATP

D. CO2, H2O, and 36 ATP D. Alcohol, CO2, and 36ATP

117. What is the purpose of the enfolding of the inner- membrane of the mitochondrion?

E. Increasing the photosynthetic capacity of the cell

F. Speeding up the loss of CO2 during fermentation

G. Speeding up the process of glycolysis

H. Increasing the surface area for ATP production

118. During chemiosmosis, what substance diffuses from one side to the other side of the membrane?

A. Water molecules B. Protons C. Electrons D. ATP molecules

119. When the muscle cells are in short supply of oxygen, which of the following compounds would be accumulated in them?

B. Ethanol B. Acetic acid C. lactic acid D. carbon dioxide

120. If there were no free oxygen to breathe, which one of the following steps of the respiration, processes operate in our body?

B. Glycolysis B. Krebs cycle C. Electron transport chain D. The link reaction

121. Which of the following is NOT usually true as an ecological succession progresses to advanced seral stages?

A. More ecological niches are formed C. The depth of the soil increases

B. Species become more diverse D. Less populations are supported

122. Among the following, which one is the best criterion to show that two populations belong to same species?

A. Morphological similarity C. inhabiting the same geographic area

B. Physiologically similarity D. production of fertile offspring

123. What is the type of community called when it has reached the final and most complex stage of a succession?

A. Pioneer community C. Climax community

B. Seral community D. Secondary community

124. Which of the following is an important way by which green plants mitigate the greenhouse effect ?

A. Use of fire wood to replace coal C. Releasing water to the atmosphere

B. Removing CO_2 from the atmosphere D. Releasing oxygen to the atmosphere

125. Which of the following is NOT true about the flow of energy in the ecosystem?

A. It is recycled by decomposers

B. It passes from one tropic level to the next

C. It enters the ecosystem in the form of light

D. It leaves the ecosystem in the form of heat

126. What is the nutritional mode of those bacteria which decompose dead organic matter and thus recycle nutrients?

A. Saprobiotic B. parasitic C. Autotrophic D. Symbiotic

127. Current human concerns such as famine, pestilence, and environmental degradation
would be solved through the use of :
a. Irrigation B. biological principles C. aquaculture D. terracing
128. What are the products of the light reactions that are subsequently used by independent
reaction of photosysnthesis?
A. Carbon dioxide and RuBP C. ATP and NADPH
B. Oxygen and carbon dioxide D. Electrons and photons
129. Pairs of electrons carried in the form, $FADH_2$ and NADH+H, collectively contain enough free energy to dephosphorylate:
A. 6 ATP B. 5 ATP C. 4 ATP D. 3 ATP
130. The immediate products of C_3 and C_4 photosynthesis in the light- independ reactions
of the Calvin cycle are, respectively
A. Ribulose bisphosphate and malic acid
B. Carbon dioxide and glucose molecule
C. phosphoglycerate and oxaloacetate
D. Glyceraldehydes phosphate and phosphor- enol- pyruvate
131. Which of the following organisms have the greatest problem with photorespiration?
A. C3 plants B. C4 plants C. C6 plants D. CAM plants
132. Which of the following is not true about homologous pairs of a chromosome?
a. They have genes controlling the same feature C. they have alleles controlling the same feature
b. Their origin is half from mother and half from father D. all of the above are true
133. What Mendel's law "law of independent assortment" states:
a. The heritable factor(allele) separate when the gametes (sex cells) are formed
b. Games are fuse randomly at fertilization
c. Inheritance of one allele is depend on inheritance of another allele
d. Inheritance of allele is not depend on inheritance of another allele
134. From the following statements, which one is true?

a. Alleles are always not simply dominant or recessive C. always a gene have no two alleles
b. Sometimes alleles of a gene are both equally dominant D. A and B are possible answers

135. Which of the following is true about the phases in **meiosis II**
a. There is no crossing over in prophase C. chromatids are separated in anaphase
b. Chromosomes line up side by side in metaphase D. all are possible answer

136. When the SRY gene on Y-chromosome is activated the bi-potential gonad develops into:
a. Testis B. Ovary C. female D. infertile embryo

137. Bothe males and females have genes that stimulate lactation, but these are express only in females. These are:
a. Sex-linked genes B. sex-influence genes C. sex-limited genes D. all of the above

138. Mode of DNA replication at which, it results in two ✌ identical DNA molecule:
a. Conservative mode B. semi-conservative C. disruptive D. none of the above

139. Which of the following is not correct about protein synthesis in prokaryotic cell?
a. mRNA do not need post-transcriptional modification C. both transcription and translation occur in cytoplasm C. mRNA needs post-transcriptional modification D. all are not correct

140. Which type of chromosomal mutation results to Downs's syndrome (47 chromosome per cell)?
a. Chromosome non-disjunction B. duplication C. Translocation D. inversion

141. In peas, a pure round seed is Crosse with a wrinkled seed. The ratio of pure round seed to wrinkled seed in F_2 generation will be:
a. **1:3** B. **3:1** C. **1:1** D. **2:1**

142. The Two daughter cells produced in mitosis will have a:
A. n number of chromosomes and will differ genetically from each other

B. 2n number of chromosomes and will differ genetically from each other
C. 2n number of chromosomes and will be genetically identical to each other
D. n number of chromosomes and will be genetically identical to each other

143. A pregnant woman has an equal chance of her baby being blood group **A** or blood group **AB**. Which one of the following shows the possible genotypes of the woman and the father of her child?
a. $I^A I^A$ and $I^B I^O$ B. $I^A I^B$ and $I^B I^O$ C. $I^A I^O$ and $I^B I^O$ D. $I^A I^B$ and $I^A I^O$

144. In the cross **AaBb X AaBb**, what will the probability of the offspring to have a genotype **aaBb?**
a. 1/16 B. 1/8 C. 1/4 D. ½

145. Mendel wants to know the exact genotype of a **round yellow** pea's seed; he then crossed with a wrinkled green pea. If the plants produced all had **round yellow** seeds but some had **green color**, what was the unknown genotype?
A. RRYY B. RrYy C. RRYy D. RrYY

146. If a heterozygous an axial flower plant crossed with a terminal flower plant and 640 offspring produced, how many offspring would have an axial flower plant.
A. 640 B. 320 C. 160 D. 480

147. Some enzymes get their name based on the source from which they identified. An example of this is
A. pepsin B. Papayin C. Nuclease D. Amylase

148. in systematic naming of enzymes, an enzyme have a name EC 4.3.11.1. From the information in which class does found the enzyme?
a. Oxidoreductase B. Transferase C. Hydrolase D. Isomerase

149. Which of the following is not a reason whey enzymes are often used in industrial processes
a. The allow reactions to carry out at lower temperature
b. More energy is used and so more CO2 is produced during the process
c. Less energy is used and so less CO2 is produced during the process

d. they reduce heating cost

150. enzymes speed up biological reactions by:

a. Increasing the activation energy B. reducing the activation energy of the reaction.

b. Increasing the kinetic energy(KE) of the reacting molecule D. reducing the KE of the reacting molecule

151. The induced fit model of enzyme action suggests that, when enzyme and substrate bind, there is a conformational change in:

a. The substrate B. the active site C. both substrate and active site D. a protein with no protein activity

152. Which of the following is not true about non-competitive enzyme inhibitor……

a. Does not compete for the active site C. bind with the allosteric site

b. Bind with active site of the enzyme D. not affected by substrate concentration

153. Extreme PHs can inactive enzymes because they:

a. Alter the charge on the amino acid in the allosteric site

b. Alter the charge on the amino acid in the active site

c. Alter the charge on the amino acid away from the allosteric site and active site D. all

154. Who declared *"omnis cellula e cellula"*?

a. Rene Dutrochet B. Matthias Schleiden C. Rudolf Virchow D. Theodor Schwann

155. 40 divisions on the scale of eyepiece graticule correspond to 16 divisions on stage micrometer. Each small division on the stage micrometer = 10 micrometer. 4 cells fit across 40 divisions of the eyepiece graticule. The length of each cell is

a. 40 micrometer B. 10 micrometer C. 40 mm D. 10 mm

156. Cube A has a side measuring 3mm. cube B has a side measuring 12 mm. the surface-are-to – volume ratio of cube A when compared to cube B is:

a. Two times bigger B. two times smaller C. Four times smaller D. four times bigger

157. Why the fluid mosaic model is called "the fluid mosaic model"? because

a. The phospholipid in the membrane can move and change position
b. The nature of fatty acid and cholesterol both affect the fluidity of the membrane
c. The protein in the membrane give patchwork appearance when viewed outside or inside
d. All of the above

158. Cytoplasm of the cell loses water by osmosis and shrinks. If the cytoplasm shrinks too much, it loses contact with the cell wall. This happen in which solution?
a. In hypotonic solution B. in hypertonic solution C. in isotonic solution

159. If you measure the CO2 uptake by wheat plants as the light intensity over the day, you cannot control the effect of change in temperature. From this hypothesis temperature is:
a. Control variable B. Dependent variable C. independent variable D. confounding variable

160. The reliability of an experiment is increased by:
a. Carrying out repeat experiment C. standardize all the procedures
b. Minimizing personal judgement D. all of the above

Question 91 is based on the table below

No of quadrats (1m X1m=1 m2	Quadrat1	Quad rat 2	Quad rat 3	Quad rat 4	Quad rat 5	Quad rat 6	Quad rat 7	Quad rat 8
No of spp. in each quadrat in the given area	5	5	7	8	4	6	5	8

161. Suppose the area of this location is 500m2. If the quadrat laid at random and so, there is no bias, how many spp. found in the given area?
a. 3000 B. 40 C. 83 D. 4000
162. A theodolite:
a. Used to measure the height of trees or slops in the area C. used to measure the rate of flow of water
b. Used to record information D. A and C are correct
163. Which of the following biological apparatus not mainly used in the field?
a. Centrifuges B. quadrats C. flow meter D. Plant presses
164. Water has high specific heat capacity. This means that it:
a. Heats up and cools down slowly C. heats up quickly but cools down slowly
b. Heats up slowly but cools down quickly D. heats up and cools down slowly
165. Which of the following is not **aldose** sugar?
a. Glucose B. Galactose C. fructose D. ribose
166. A linear molecule containing of may handreds of **a-glucose** molecule joined by **a-1,4-glycosidic** bond is:
a. Amylopectin B. amylose C. glycogen D. A and B are answers
167. In water, □ phospholipids become organized into a bilayer. In this configuration:
a. The hydrophilic heads face outwards into the water
b. The hydrophobic tail face outwards into the water
c. The hydrophilic heads face inward away from the water
d. The hydrophobic tail face outwards into the water
168. When heated with benedicts solution, sucrose does not cause a color change because it is:
a. A reducing sugar B. a disaccharide C. a non-reducing sugar D. a compound sugar
169. Which of the following is not an endemic Ethiopian species of animal?

a. Mountain Nyala B. Ethiopian wolves C. Gelada baboon D. Roan antelope

170. Which of these chemicals has caused the formation of the 'ozone hole'?

a. ***Sulphur dioxide B. Carbon dioxide C. CFCs D. nitrogen oxides***

171. A student was added Unknown enzyme into two test tubes. The first test tube contained starch, the second one – sucrose. After 10 minutes incubation the solution in the first tube gives the positive result, in the second one – negative. What was the enzyme added?

B. Lipase B. Sucrase C. Amylase D. Lactase

172. What is the sugar derived from two alpha glucose molecule?

B. Lactose B. Sucrose C. Cellulose D. Maltose

173. What is the method of gathering information by using your senses?

C. Observation C. Prediction

D. Experiment D. Conclusion

174. The structure of a protein that describes the overall shape formed by several polypeptide chains which compose the protein.

a. Primary structure C. Secondary structure

b. Tertiary structure D. Quaternary structure

175. All the following reactions involve condensation reactions, EXCEPT?

A. the formation of a disaccharide C. the digestion of a polysaccharide

B. the production of a polypeptide D. the production of a complex sugar

176. Which pairs of element is required, in order to the compound to consider as organic?

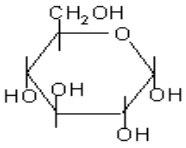
A. Carbon and hydrogen C. carbon or oxygen

B. carbon and oxygen D. Carbon or hydrogen

177. All of the following are structural carbohydrates, EXCEPT**?**

A. peptidoglycan B. Glycogen C. chitin D. Cellulose

Based on the structure below identify the hexose molecule

178. Which of the following is the correct name for the above monosaccharide structure? 

a. α-glucose C. Fructose

b. β-glucose D. Galactose

179. Functions of isomerase enzymes:

a. Change of the molecular form of the substrate molecules

b. Joining of two molecules by the formation of new bonds

c. Transfer of a specific group from one substrate to another

d. Removal of non-hydrolytic group from a substrate molecules

180. By common naming enzymes are named based on the source from which they were first identified. An example of this is:- A. Pepsin B. Papayin C. protease D. Amylase

181. Why are T-lymphocytes more vulnerable to HIV infection? Because they possess:

a. Gp 120 on their surface C. CD4 receptor protein

b. Thin cell membrane D. gp 41 on their surface

182. Which of the following is Non-reducing sugar?

a. Glucose B. galactose C. sucrose D. starch

183. Which component of lipid form **Bilaye**r structure in water?

a. Triglyceride B. phospholipids C. waxy D. all are answers

184. From EC 3.4.5.6 , what is the class of enzyme?

a. Transferase B. Oxidoreductase C. Hydrolase D. Ligase

185. Which of the following is **active enzyme?**

a. Apoenzyme B. cofactor C. Holoenzyme D. all are answers

186. Which one of the following **concentrations of [H^+]** have more **acidi**

a. 0.001 M B. 0.01 M C. 0.00001 M D. 0.0001 M

187. When an enzyme is subjected to excess heat:

a. Bonds in the active site are strained C. some of the bonds in the ac site break

b. The active site undergoes a conformational change D. all of the a

188. Being HIV-positive means that:-

a. A person has AIDS C. A person has been in

contact with HIV

b. A person has other diseases because of HIV D. A person has HIV antibody in his or her blood

189. . In peas, a pure tall plant (TT) is crossed with a pure short plant (tt). The ratio of **pure tall** plants to **pure short** plants in **F_2** generation will be: A. **1:3** B. **3:1** C. **1:1** D. **2:1**

190. Cross between two individuals results in a ratio of **9: 3: 3: 1** for four possible phenotypes of progeny. This is an example of a:

A. Trihybrid cross B. Test or back cross C. Dihybrid cross D. Monohybrid cross

191. Which of the following can be given as a good reason for finding large numbers of

Plant and animal spp. In Ethiopia today?

A. Lack of ecological disturbance C. Environment free from predators

B. Presence of many biomes and habitats D. Good ecological and biodiversity management

192. Which of the following is **NOT** true about the flow of energy in the ecosystem?

E. It is recycled by decomposers

F. It passes from one tropic level to the next

G. It enters the ecosystem in the form of light

H. It leaves the ecosystem in the form of heat

193. What is the nutritional mode of those bacteria that decompose dead organic matter and thus recycle nutrients?

a. Saprobiotic B. parasitic C. Autotrophic D. Symbiotic

194. What does a low value of Simpson's index of diversity normally indicates?

A. An area with high number of endemic species C. A biodiversity hotspot with abundant species

B. An area with plants but no species of animals D. An area dominated by one or just a few species

195. Which of the following terms specifically refers to an ecological succession that starts in an aquatic environment?

A. Secondary succession B. xerosere C. primary succession D. Hydrosere

196. Which of the following organisms usually forms the pioneer community in a primary biological succession?

A. Annual herbs B. lichens C. Trees D. Ferns

197. In the carbon cycle, which of the following processes removes carbon dioxide from the atmosphere?

A. Respiration B. Decomposition C. Combustion D. photosynthesis

198. Which of the following is an important way by which green plants mitigate the greenhouse effect?

C. Use of fire wood to replace coal C. Releasing water to the atmosphere

D. Removing CO_2 from the atmosphere D. Releasing oxygen to the atmosphere

199. **Intra**-specific competition is:

A. competition between members of different species in the same habitat

B. competition among members of the same species in the same habitat

C. competition among members of the same species in the same ecosystem

D. competition between members of different species in the same ecosystem

200. Which of the following is **abiotic factors** that influence how quickly a population increases or decreases in size?

B. Predation B. Pathogens C. Temperature D. Competition

201. Which of the following is most diverse of all marine habitats?

B. Coral reef B. Estuarine C. Wetlands D. Freshwater

202. A secondary succession differs from a primary succession to the same climax in that it:

A. requires pioneer species to start C. have an existing seed bank to draw on

B. Takes a greater period D. starts from uncolonised ground

203. The most usual way to think of biodiversity is:

A. species richness B. cultural variability C. genetic variability D. size variability

204. A type of biome consisting of an area of land is termed as:

A. Marine biomes B. Terrestrial biome C. Estuarine biome D. Freshwater biomes

205. Which of the following are the most significant factors in determining biome type?

C. Soil type and soil depth C. Temperature and climates

D. Temperature and rainfall D. Climates and grazing animals

206. Mendel wants to know the exact genotype of a **round yellow** pea's seed; he then crossed with a wrinked green pea. If the plants produced, all had **round** seeds but some had **green and some had yellow seed**, what was the unknown genotype? A. RRYY B. RrYy C. RRYy D. RrYY

207. If a **heterozygous round yellow** seed is self-crossed, what will be the proportion of the offspring to have a genotype of **pure round yellow** seed and **heterozygous round yellow** seed respectively?

A. 1/16 and ¼ B. ¼ and 1/16 C. 1/16 and 1/8 D. 1/8 and ¼

208. If a heterozygous an axial flower plant is crossed with a terminal flower plant and 640 offspring were produced, how many offspring would have an axial flower plant. (the trait is determined by dominant allele)

B. 640 B. 320 C. 160 D. 480

209. A homogeneous long winged fly was cross breed with a short winged fly and produce all long winged flies in F1 generation. What is phenotype ratio of fly's wing in F2 generation? (the trait is determined by dominant allele)

a. 3 long : 1 short B. 1 long : 2 hybrid :1 short

b. 2 long : 2 short D. all long

210. The final and most complex state of a succession is called:

a. Primary succession B. secondary succession C. climax community D. all are correct

211. Which of the following trends occur in any succession?

A. Total biomass of the community increase C. The species diversity increase

B. The number of ecological niches increase D. all are correct answer

212. Which of the following factors increase the size of human population globally

A. Immigration B. Natality rate C. Emigration D. mortality rate

213. Bacteriophages:

A. a plant-infecting viruses B. an animal-infecting viruses

C. a fungus- infecting viruses D. a bacteria-infecting viruses

214. Ethiopia has a high biodiversity now, but the biodiversity is threatened by all, EXCEPT?

A. Commercial logging C. Subsistence farming

B. Burning of vegetation D. Maintaining habitats

215. In exponential population growth pattern, numbers:

A. increase by a fixed amount in each time period

B. decrease by a fixed amount in each time period

C. increase by an increasing amount in each period

D. decrease by an increasing amount in each period

216. In which of the following the population growth curve, all the organisms are adapted and reproduce rapidly due to the abundant resources?

A. Lag phase C. Decline phase

B. Log phase D. Stationary phase

217. Which members of vertebrates have the highest biodiversity in Ethiopia?

a. Mammals B. birds C. reptiles D. amphibian

218. A long strand, structured and bounded by histone protein to stored a large number of gen is:

a. DNA B. RNA C. Allele D. Chromosome

219. A woman is colored blind. What is the chance that her son will be colored blind?

a. 0% B. 25% C. 50% D. 100%

220. In DNA 40% of the base are known to contain guanine if there are 1800 thiamine. How many cytosine bases are there in the DNA? A. 450 B. 1200 C.2700 D. 7200

221. Which of the following would cause **Erythroblastsis fatalist** (induced abortion)?

a. Father Rh^-, Mother Rh^- and Baby Rh^- C. Father Rh^+, Mother Rh^- and Baby Rh^-

b. Father Rh^+, Mother Rh^- and Baby Rh^+ D. Father Rh^-, Mother Rh^+ and Baby Rh^+

222. A woman is married for the second time. Her first husband was blood type B, and her child by that marriage was blood type O. Her new husband is type A and their child is type AB. What is the woman's genotype and phenotype?

a. Heterogeneous B C. Homogenous B

b. Heterogeneous A D. Homogenous A

223. What is the correct equation for cellular respiration?

E. $6CO_2 + 6H_2O +$ energy $\rightarrow$ $6O_2 + C_6H_{12}O_6$

F. $6O_2 + C_6H_{12}O_6 \rightarrow 6CO_2\ 6H_2O$

G. $6O_2 + C_{12}H_{12}O_6 \rightarrow 6CO_2 + 6H_2O$ + Energy

H. $6CO_2 + 6H_2O + 6O_2 \rightarrow$ C6H12O6 + energy

224. If there were no free oxygen to breathe, which one of the following steps of the

Respiration process operate in our body.

C. Glycolysis B. Krebs cycle C. Electron transport chain D. The link reaction

225. Which of the four stages in the aerobic respiration of glucose does NOT produce ATP by substrate level phosphorylation?

Glycolysis B. Krebs cycle C. The link reaction D. Electron transport & chemiosmosis

226. What is the method of gathering information by using your senses?

E. Observation C. Prediction

F. Experiment D. Conclusion

227. A scientist studying the life cycle of insect is a specialist in the field of _____

Ethology B. Entomology C. Etiology D. Ethnology

228. Which of the following RNA type has the potential to treat conditions such as AIDS by preventing replication of HIV and cancers by silencing genes that enhance cell division?

A. mRNA B. tRNA C. rRNA D. siRNA

229. In the process of transcription, _____.

A. DNA is replicated C. proteins are synthesized
B. mRNA is synthesized D. mRNA attaches to ribosome

230. Which of the following bacteria changed the reduced atmosphere into oxygen-rich atmosphere?

A. Sulphobacteria B. Methanobacteria C. Halophilic bacteria
D. Cyanobacteria

231. A researcher made an interesting observation about a protein made by the rough ER and eventually used to build a cell's plasma membrane. The protein in the membrane was actually slightly different from the protein made in the ER. The protein was probably changed in the:

A. Rough ER C. Mitochondrion
B. Smooth ER D. Golgi apparatus

232. You are studying the transport of a certain type of molecule into cells. You find that transport slows down when the cells are poisoned with a chemical that inhibits energy production. Under normal circumstances, the molecule you are studying is probably transported into the cell by….

A. simple diffusion C. active transport
B. facilitated diffusion D. passive transport

233. In which of the following the population growth curve, all the organisms are adapted and reproduce rapidly due to the abundant resources?

C. Lag phase C. Decline phase
D. Log phase D. Stationary phase

234. Which members of vertebrates have the highest biodiversity in Ethiopia?

a. Mammals B. birds C. reptiles D. amphibian

235. In eukaryotic organism :

a. Transcription and translation are coupled C. Transcription occurs in the nucleus
b. Translation occurs in the nucleus D. mRNA does not need post-transcriptional processing

236. Which molecules carry the instructions for protein synthesis?
a. Carbohydrates and lipids B. DNA and RNA C. Enzymes D. amino acids

237. If a codon on the mRNA is AGU, what is the complimentary anticodon on the tRNA?
a. TCA b. UGT c. UCA d. AGU

238. The genetic code is:
a. A triplet code, degenerate and overlapping C. A double code, degenerate and universal
b. A double code, degenerate and non – overlapping D. A triplet code, degenerate and universal

239. Down's syndrome is characterized by:
a. Mental retardation B. Heart defects C. stunted growth D. all are possible answer

240. Which one of the following terms refers to the failure of sister chromatids to separate from one another during anaphase?
A. Non – disjunction B. deletion C. Replication D. double inversion

241. Which of the following is an example of a chromosomal mutation?
a. A base duplication B. A translocation C. A base insertion D. None of the above

242. The increase in bacterial resistance to a penicillin is due to:
a. Mutation B. Natural selection C. The increase use of penicillin D. A combination of all of the above

243. Cyanobacteria;-
a. They were responsible for the increase in the free O_2 in the atmosphere
b. They are photoautotrophic.
c. They use light as a source of energy and Co2 as a source of carbon (photosynthesis)
d. all are possible answers

244. Which one of the following is a common idea held by all/the entire creationist?

a. Life is eternal
C. All life was created in six days
b. Life was created by supernatural being
D. Life come to earth from elsewhere in the universe

245. Which of the following is the most accepted theory about the origin of life on earth?

a. Theory of spontaneous evolution
C. The theory of chemical evolution
b. The cosmic theory
D. The theory of special creation

246. If a substitution occurs in the DNA of an organism, which of the following also occur?

a. The RNA also altered
C. All the triplets after the mutation will be altered
b. All the triplets before the mutation will be altered
D. A frame shift will occur

247. Which one of the following is **not true** about Gram's negative bacteria?

A. They have outer membrane in their cell wall
C. They have much less peptidoglycan

B. Most of them are pathogenic bacteria
D. none of the above is answer

248. **Hemophilia** and **sickle-cell** disease are examples of……..

A. Genetic diseases.
B. Degenerative diseases
C. Human induced diseases
D. none

249. Which of the following is the not alternative name of an organism that contains a gene or genes transferred from another organism belonging to a different species is :

A. Transgenic organism
B. recombinant organism
C. pathogenic organism
D. Hybrid organism

250. An **anti retroviruses drug** that prevents the **assembly** of new virus particles is called

A. Entry inhibitors B. Nucleotide reverse transcriptase inhibitors

C. Non-nucleotide reverse transcriptase inhibitors D. Protease inhibitors

251. In Ethiopian animal diversity, which group is represented by the highest number of
orders, families generation and species?
A. Birds B. Amphibians C. Fish D. Mammals

252. Which component of soil fertility is improved when farmers grow legumes plant in crop
rotation?
A. Phosphorus B. Nitrogen C. Sulfur D. Carbon one of the following biomes

253. Which of the following is NOT usually true as an ecological succession progresses to
advanced seral stages?
C. More ecological niches are formed C. The depth of the soil increases
D. Species become more diverse D. Less populations are supported

254. Among the following, which one is the best criterion to show that two populations
belong to same species?
C. Morphological similarity C. inhabiting the same geographic area
D. Physiologically similarity D. production of fertile offspring

255. What is the type of community called when it has reached the final and most complex stage of a succession?
C. Pioneer community C. Climax community
D. Seral community D. Secondary community

256. Which of the following is an ecosystem?
A. Tropical Rainforest C. All the organisms in a given area
B. The African continent D. The non- living components of an environment

257. What is the main reason for the high species richness of plants and mammals

observed in Ethiopia?

A. Lack of predators C. Presence of several biomes within the country

B. Lack of disturbance D. Efficient management of the ecological resource

258. In nutrient cycle, which of the following molecule form **acidic rain**

A. CO_2 B. PO_4^- C. SO_2 D. CO_4^-

259. Which one of the following concepts contains all the others?

A. Species B. Genus C. Population D. Community

260. Which of the following are the most significant factors in determining a biome type

A. Temperature B. precipitation C. rain fall D. all are correct answer

261. Which of the following region of biome is the most diverse of all marine habitat

A. Pelagic B. abyssal C. coral reef D. estuarine

262. The most complex and species rich ecosystem in the world is :

A. Tropical rainforest B. savanna grassland C. temperate rain forest D. tundra

263. What characterizes a prokaryotic cell?

A. the presence of mitochondria C. the membrane bound nucleus

B. the presence of chloroplasts D. the unicellular level of organization

264. Which of the following carbon cycle process increases the carbon dioxide concentration in the atmosphere?

A. Feeding, respiration and photosynthesis C. Combustion, fossilisation and respiration

B. Assimilation, feeding and photosynthesis D. Combustion, fossilization and decomposition

265. What are the four main classes of large biological organic molecules in a cell?

A. Proteins, carbohydrates, lipids and nucleic acids
B. Proteins, carbohydrates, minerals and vitamins
C. Amino acids, carbohydrates, steroid and nucleic acids
D. Amino acids, monosaccharide, glycerol and nucleic acids

266. The conversion of one molecule of glucose to two molecules of pyruvate results in the net formation of:
A. two molecules of ATP
B. four molecules of ATP
C. thirty-six molecules of ATP
D. thirty-eight molecules of ATP

267. What is CD4?
A. The surface on T-helper cells
B. The surface on HIV
B. the surface on B-cells
D. the surface on RNA viruses

268. Biologist advice to government of a nation to plant more trees in order to reduce concentration of CO2 from atmosphere ; this is the relevance of biology in;
A. Agriculture B. Medicine C. Environment D. Biotechnology

269. From which of the following components of lipid does the basic components of all cell membrane is made.
A. Triglyceride B. phospholipids C. waxy D. all are correct answers

270. Which of the following is not true about DNA molecule?
A. It is huge molecule B. it is stable molecule C. it is double helix D. it is temporary storage of genetic information.

271. Which of the following molecule is not polymer?
A. Starch B. Protein C. Cellulose D. Lipids

272. Which of the following is odd?
A. Glucose B. Lactose C. Galactose D. fructose

273. Which of the following is **miss- matched?**
A. Cellulose-plants B. peptidoglycan- bacteria C. Chitin-fungi D. none of the above

274. Which wavelength of light penetrate ocean deeper than others?

A. Red and indigo B. blue and green C. Violet and yellow D. A and B are possible answers

275. The conversion of one molecule of glucose to two molecules of pyruvate re in
the net formation of:-
C. two molecules of ATP C. three molecules of ATP
D. Six molecules of water D. thirty- eight molecules of ATP

276. Anaerobic metabolism refers to the generation of ATP:
C. Without the involvement of ADP C. without the use of oxygen
D. Without the use of glycogen D. by the conversion of pyruvate to lacta

277. Glycolysis occurs in the _____?
B. Cytoplasm B. Mitochondria C. Nucleus D. Chloroplast

278. During anaerobic respiration, what is the gross number of ATP molecules t are produce per glucose
molecule?
B. Two B. Three D. Four D. Six

279. For which of the following processes is ATP **NOT** required?
E. Diffusion of oxygen into cells
F. Synthesis of molecules
G. Active transport of molecules from one site to another
H. Muscle contraction

280. What is the molecule in plant cells that first captures the radiant energy fr sunlight?

ATP B. DNA C. Chlorophyll D. Carbon dioxide

281. Under what condition do C4 plants have more photosynthetic efficiency tha plants not?
B. Low water supply B. Low temperature

C. Low light intensity D. Low CO_2 concentration

282. Which of the following processes releases CO_2 into the atmosphere?
B. Respiration B. Assimilation C. Feeding D. Photosynthesis

283. Which of the following is the adaptaptation by C4 plants that helps them to avoid
photorespiration?

E. Harvesting of carbon dioxide at night
F. Using separate cells for light & dark reactions
G. Storing carbon dioxide in the vacuole
H. Keeping the stomata closed during the day

284. Which of the following substances is NOT formed when glucose is ferment
yeasts?
A. alcohol B. ATP C. Lactic acid D. Carbon dioxide

285. In which industrial products is pyruvate fermentation by yeast practically applied?
B. Brewing beer B. Swiss cheese making
C. production of vinegar D. yoghurt making

286. When athletes take part in short distance running, how do the cells generate most of the energy that is quickly needed?
C. Aerobic respiration in muscle cells C. Anaerobic respiration in muscle cells
D. Mitochondrial respiration in any cell D. Yeast fermentation in the stomach

287. Which of the following happens in both cyclic and non- cyclic Photophosphorylation?
B. ATP is formed B. Oxygen is generated
C. NADP is reduced D. water molecule splits

288. Which of the following is NOT true about C4 plants such as tef (*Eragrostis tef*)?
E. CO2 is harvested during the night time
F. The bundle sheath cells contain chloroplasts
G. Light- dependent reaction occurs in mesophyll cells
H. Chloroplasts of bundle sheath cells lack thylakoids

289. Which of the following substances is NOT necessary for photosynthesis to take place?
B. Chlorophyll B. Carbon dioxide C. Oxygen D. Water

290. Where exactly in the cell does the Krebs cycle take place?
C. Mitochondrial matrix C. Cytoplasmic fluid

D. Inner mitochondrial membrane D. Outer mitochondrial membrane

291. The molecule of which pigment is located at the reaction center of a photosystem?

B. Chlorophyll a B. Chlorophyll b C. Carotenoid D. Accessory pigments

292. In which of the following ways is the carbon dioxide of the atmosphere fixed into

the carbon found in organic molecules?

E. In the breathing processes of all animals

F. In the decomposition of organic molecules

G. In the process of photosynthesis by green plants

H. In all the cellular respiration processes of organisms

293. What is the importance of chemiosmosis in photosynthesis and cellular respiration

C. Splitting of water molecule C. Combining hydrogen and carbon

D. Operating t he proton pump D. Synthesizing ATP

294. Where does the light dependent reaction of photosynthesis occur in the chloroplast?

C. In the thylakoid membrane C. In all parts of the chloroplast

D. In the fluid of the stroma D. In the stomatal opening

295. For which of the following process does the sugar produced by photosynthesis **NOT** used?

B. To produce biomass B. To make new DNA

C. To produce ATP in respiration D. To produce enzymes

296. When the muscle cells are in short supply of oxygen, which of the following

Compounds would be accumulated in them.

C. Ethanol B. Acetic acid C. lactic acid D. carbon dioxide

297. What is the correct equation for cellular respiration?

I. $6CO_2 + 6H_2O + energy \rightarrow 6O_2 + C_6H_{12}O_6$

J. $6O_2 + C_6H_{12}O_6 + 6CO_2 \rightarrow 6H_2O + energy$

K. $6O_2 + C_{12}H_{12}O_6 + energy \rightarrow 6CO_2 + 6H_2O$

L. $6CO_2 + 6H_2O + 6O_2$ → $C6H12O6$ + energy

298. What amount of net gain in ATP does glycolysis provide to a cell?

B. 2 ATP molecules B. 4 ATP molecules C.18 ATP molecules D. 36 ATP molecules

299. How many moles of ATP will be generated as a result of oxidation of one mole of FADH2

In an actively respiring mitochondrion? A. 2 B. 3 C. 4 D. 6

300. If there were no free oxygen to breathe, which one of the following steps of the

respiration process operate in our body?

D. Glycolysis B. Krebs cycle C. Electron transport chain D. The link reaction

301. What is the source of the oxygen that is produced during the process of

photosynthesis by higher plants?

B. CO_2 B. H_2O C. ATP D. Chlorophyll

302. In aerobic respiration of cells, in which cellular part does the Krebs cycle (citric acid

cycle take place?

B. Chloroplast B. Mitochondria C. Nuclei D. Lysosomes

303. What is the final electron acceptor in the electron transport chain of cellular respiration?

B. O_2 B. H_2 C. $NADP^+$ D. NAD^+

304. In an experiment to study photosynthesis. a plant was provided with radioactive carbon dioxide as a metabolic tracer and the radioactive carbon was incorporated first into oxaloacetate. Which one of the following would best characterize this plant?

B. C3 plant B. C4 plant C. CAM plant D. Heterotrophic plant

305. When single-stranded DNA from a human is mixed with single-stranded DNA from a chimpanzee, we find that about 98% of the DNA is homologous. This can be taken as evidence that:

B. humans evolved from chimpanzees
C. chimpanzees evolved from humans
D. humans and chimpanzees are closely related

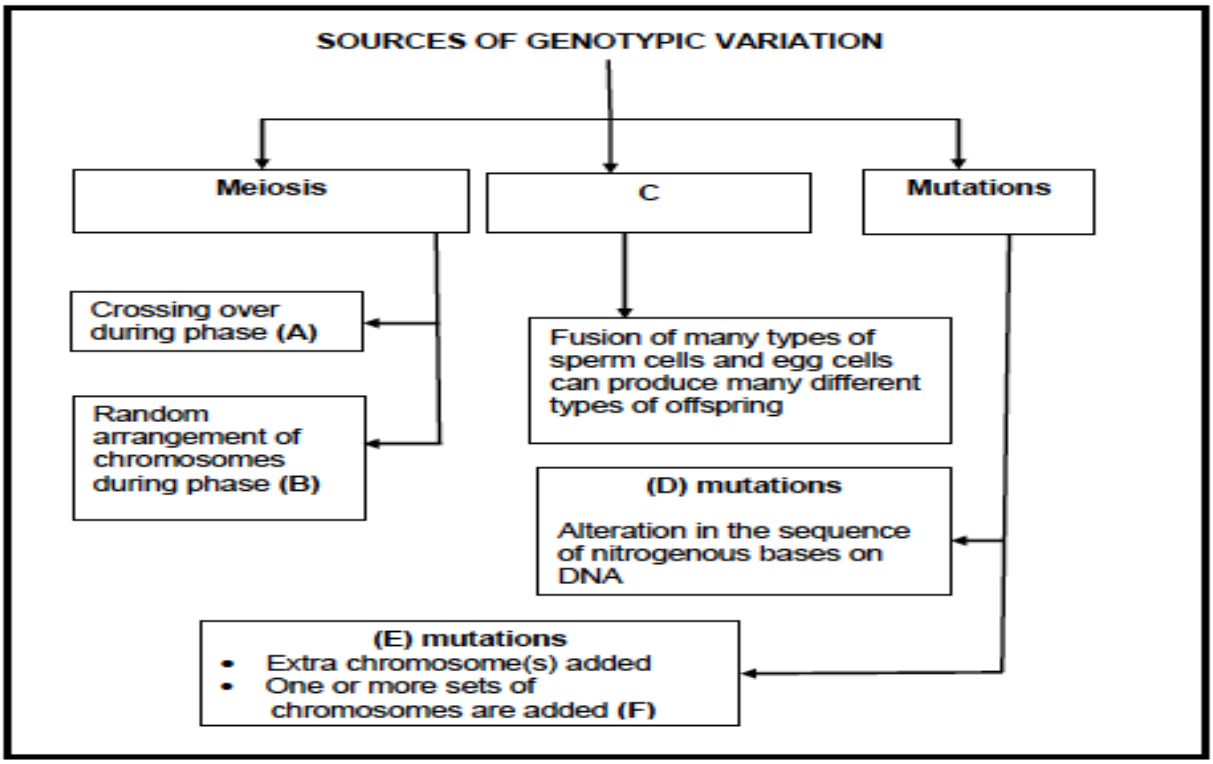
E. humans and chimpanzees originated in similar environments

306. Which of following is NOT the observations on which Darwin based his theory of evolution?
    a. The offspring show a great deal of genetic variation
    b. Characteristics are inheritable from parent to offspring
    c. The inheritance the acquired traits from parent to offspring
    d. Competition of offspring for resources (survival of the fittest)

307. Which of the following is the group of organisms responsible for production of the first oxygen on the Earth? A. Archaebacteria C. Eukaryotes C. Ordinary bacteria D. Cyanobacteria

308. A chromosome mutation in which extra base pair is added in DNA sequence is called:
    a. Deletion B. Insertion C. Inversion D. Translocations

Question number 5, 6 and 7 depends on the following diagram.



309. What is the process labelled **C** that is a source of genetic variation?

A. Sexual Reproduction
B. Asexual Reproduction
C. Segregation of chromosomes
D. Recombination of chromosomes

310. What are the phase of meiosis, labeled **A** and **B**, respectively?

A. Prophase I and Metaphase I
B. Metaphase I and Prophase I
C. Telophase I and Anaphase I
D. Anaphase I and Telophase I

311. What are the TWO types of mutations, labeled **D** and **E**, respectively?

A. Addition and substitution mutations
B. Gene mutation and point mutations
C. Gene mutation and chromosomal mutations
D. Harmful mutations and harmless mutations

312. Chromosomes are made from two chemicals:

A. DNA and a set of globular proteins
B. RNA and a set of globular proteins
C. DNA and a set of fibrous proteins
D. RNA and a set of fibrous proteins

313. The codon is found on _____, and the anticodon is found on _____.

A. tRNA, mRNA
B. rRNA, mRNA
C. mRNA, tRNA
D. mRNA, rRNA

314. In the process of transcription, _____.

C. DNA is replicated
D. mRNA is synthesized
C. proteins are synthesized
D. mRNA attaches to ribosome

315. Which of the following is NOT archaebacteria?

B. Sulphobacteria
B. Methanobacteria
C. Halophilic bacteria
D. Cyanobacteria

316. A researcher made an interesting observation about a protein made by the rough ER and eventually used to build a cell's plasma membrane. The protein in the membrane was actually slightly different from the protein made in the ER. The protein was probably changed in the:

C. Rough ER C. Mitochondrion

D. Smooth ER D. Golgi apparatus

317. You are studying the transport of a certain type of molecule into cells. You find that transport slows down when the cells are poisoned with a chemical that inhibits energy production. Under normal circumstances, the molecule you are studying is probably transported into the cell by….

C. simple diffusion C. active transport

D. facilitated diffusion D. passive transport

318. Which of the following RNA type has the potential to treat conditions such as AIDS by preventing replication of HIV and cancers by silencing genes that enhance cell division?

B. mRNA B. tRNA C. rRNA D. siRNA

319. Which of the following is **not** the property of genetic code?

A. triplet code C. overlapping code

B. universal code D. Degenerative code

320. Adenine makes up 40% of the nucleotides in a sample of DNA from an organism. Approximately what percentage of the nucleotides in this sample will be guanine?

A. 40% B. 80% C. 10% D. 20%

321. Which of the following pairs are ANALOGOUS structures?

A. The human arm and the front leg of a mule C. The front leg of a frog and the wing of a

B. The wing of a bird and the wing of a butterfly D. The wing of a bat and the wing of a bird

322. The sperm move from the testes through the urethra, and semen containing millions of sperm is released inside the vagina in a process:

A. Ovulation C. Menstruation

B. Menopause D. Ejaculation

323. Which of the following is physical method of contraception?

A. Diaphragm C. Female sterilization
B. Mixed pill D. Breast feeding

324. The word homeostasis comes from the two Greek words homoios, which means?

A. Same C. Science
B. Study D. State

325. Which part of the female reproductive system does fertilization of the ovum take place?

a. Uterus C. Fallopian tube
b. Cervix D. Vagina

326. Which of the following statement is correctly evaluate poikilotherms animals? A. Organisms whose body temperature is governed by the external temperature.

B. Organisms with a relatively constant internal body temperature.
C. Birds and mammals are examples of poikilotherms.
D. Humans are a well-known example of poikilotherms.

327. consider the following temperature regulation ways.

I. Panting and licking
II. Sweating
III. Hibernation
IV. Vasoconstriction

Which of the above temperature regulation ways is Physiological methods of temperature regulation in homoiotherms?

a. I, III and IV B. II, III and IV C. I, II and IV D. I, II, III and IV

328. Which of the following statement is incorrect about human kidney?

A. Urea is produced in kidney when excess amino acids are broken down.

B. The urea is filtered out of the blood by the kidneys and removed in the urine.
C. Kidneys are one of the main excretory organs and main organs of homeostasis.
D. Play a major role in regulating the water and salt balance of your body.

329. which of the following statements is incorrectly paired the cross section parts of leaf and its role? A. Waxy cuticle is a waterproof layer help to prevent water loss.
B. Palisade mesophyll control the size of stomata by altering their shape.
C. Spongy mesophyll the main gas exchange tissue of a leaf.
D. stomata that can be opened or closed to control gas exchange and water loss.

330. Based on the above diagram number “1” represents:
A. Midrib C. Blade
B. Petiole D. Cuticle

331. All of the following is the requirements of photosynthesis to take place except one?

A. Water-from soil C. Sugar -from the food
B. Carbon dioxide- from the air D. Chlorophyll-found from chloroplast

332. Which of the following is true about light -independent reaction stage of photosynthesis?

A. It does not require light that means it occurs at night time.
B. It takes place in the grana of chloroplast.
C. It does not involve the use of products of light dependent sage.
D. It take place in the stroma of the chloroplast.

333. The process by which water absorbed by plants, usually through the roots, is evaporated into the atmosphere from the plant surface, principally from the leaves is;

A. Transpiration C. Percolation B. Evaporation D. Photosynthesis.

334. Suppose plant A and B are destarched. Plant A has no co2 supply, whereas plant B has normal level of co2.Both are given sunlight four hours and tested for the presence of starch. which of the following is true about the amount of starch produced by plant A?

A. Less amount of starch is produced by plant A than by plant B.
B. Equal amount of starch is produced by plant A and plant B.
C. Amount of starch is produced by plant A is greater than or equal to plant B.
D. Amount of starch is produced by plant B is less than plant A.

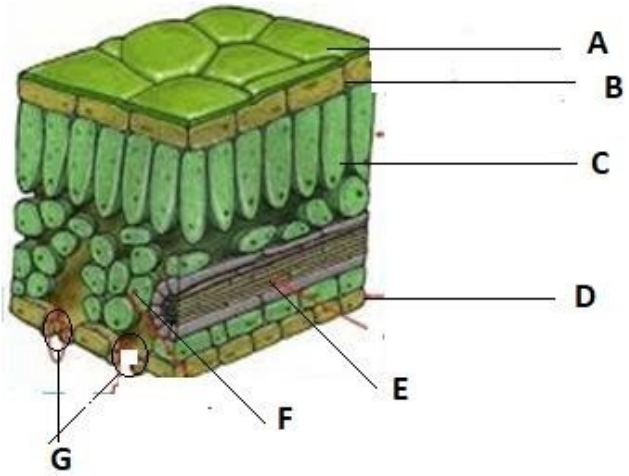
335. Which particular chemical substances are used to absorb co2 from surrounding air? A. Copper sulphate and iodine and solution

B. Biruet and starch solution
C. Potassium hydroxide and sodalime solution
D. Dichlorphenolindophenol and salt solution

336. Which of the following is true about phloem?

A. Dead tissue which brings water from the soil to the cells of the leaves.
B. Living tissue which carries the products of photosynthesis away from the leaves to all of the cells of the plant.
C. The hollow cells of a plant that transport water and minerals to plant cells.
D. The food conducting dead tissue of a plant.

Item number 40 and 41 based on the diagram



337. In the above figure letters, A, B, C, and D respectively represents:

A. waxy cuticle, upper epidermis, palisade mesophyll and spongy mesophyll

B. waxy cuticle, upper epidermis, palisade mesophyll and lower epidermis

C. waxy cuticle, upper epidermis, lower epidermis and spongy mesophyll

D. upper epidermis, palisade mesophyll and spongy mesophyll and lower epidermis

338. Based on the above diagram number “4” represents:

a. Spongy mesophyll C. Palisade mesophyll
b. Upper epidermis D. Lower epidermis

339. Which of the following statement is correctly explain about adhesive and cohesive forces? A. Adhesive forces are attraction between different types of molecule. B. Cohesive forces are attraction between different types of molecule

a. Adhesive forces are attraction force between water molecule.
b. Adhesive forces are attraction force between similar types of molecule.

340. Which of the following is correct about plant growth hormone?

I Abscisic acid inhibits growth and plays a major role in leaf fall.

II Ethylene is a gas at room temperature and it causes fruit to ripen.

III Cytokinins are hormones that stimulate cell division in plants are important in plant growth. IV. Gibberellins is a gas at room temperature and it causes fruit to ripen.

A. I, II and IV C. I, II and III

B. I, III and IV D. II, III and IV

341. Which of the following is a non-renewable resource?

A. water C. Iron

B. Air D. Coffee

342. Among the following statement all are true about renewable natural resource except one? A. They are resources that are capable of being produced indefinitely.

B. Managed carefully, they can be used, reused and replaced easily.

C. Are mostly living things and their products.

D. Are not living, and when they are used they cannot be replaced.

343. Which of the following is not a way of conserving naural vegetation?

a. Aggravating deforestation C. Farming sustainably

b. Replanting endemic species D. Protecting natural habitats

344. which one is not the reason that leads biodiversity lost around the world? A. Huge areas of land are used to monocultures.

B. The cutting down of most original forests.

C. Climate change, pollution and human activities.

D. Huge areas of land are used to polycultures.

345. which endemic plant species is not found in Ethiopia?

a. Ficus vasta Forssk C. Enset (Ensete ventricosum) B. Niger seed (Guizotia abyssinica) D. Red maple (Acer rubrum)

346. Which of the following is not an example of endemic Ethiopian wildlife?

a. Gelada Baboon C. Cheetah stock
b. Swayne’s Hartebeest D. Menelik’s Bushbuck

347. Wild life conservation involves protection of habitat and managing population through all of the following except one:

a. Establishment of wild life conservation areas.
b. Preventing the spread of diseases.
c. Establishing laws to control illegal effects of human.
d. promoting the spread of diseases.

348. which of the following statement is not the effect air pollution on human’s health?

A. Skin cancer C. Heart disease
B. Chronic respiratory problems D. Wildfires

349. Among the most famous Ethiopian biologist, who has been honored by developing high yielding strains of sorghum?

A. Professor Tilahun Yilma C. Dr.Tewolde Berhan G/Egziabher B. Professor Tilahun Yilma D. Dr.Gebissa Ejeta

350. Which of the following are not the advantages of Dr.Aklilu Lemma discovery using local plant Endod than other chemical molluscicide?

A. It is inexpensive C. It is less effective
B. It is environmentally friendly D. It is well known by local people

351. Which of the following does not evaluate the establishment of biological research institutions and its significant in Ethiopia?
   A. It helps to train highly skilled researchers and scientists
   B. It helps to limit the standard of biological research
   C. To enhance overall development of our country Ethiopia
   D. To increase international partnership with other countries

352. Which of the following institution conduct research in to leprosy and tuberculosis?
   A. Ethiopian health and nutritional research of institute
   B. Armauer Hansen Research institute
   C. Ethiopian institute of agriculture research institute
   D. Institute of biodiversity conservation

353. In what feature plant cells are different from animal cells?
   A. They have no cell wall C. Have regular shape
   B. They are relatively small in size D. Have irregular shape

354. Which of the following is not the characteristics of all living organisms?
   a. Religious C. Movement
   b. Reproduction D. Irritability

355. Which of the following explain the adding of chemicals to see a bright and colorful picture of a specimen and its parts?
   a. Magnification C. Mounting
   b. Resolution D. Staining

356. Which of the following is an advantage of the light microscope?
   a. It can be used anywhere with electricity
   b. It has high magnification and resolution
   c. It is relatively heavy so can be carried out into the field
   d. It is relatively inexpensive.

357. Which of the following organelles is found in large number in cells that carry out active transport process frequently?

a. Cell membrane C. Mitochondria
b. Cytoplasm D. Ribosomes

358. If the total magnification power of a compound microscope is 200X.The magnification power of the ocular lens is 10x.What will be the magnification power of objective lens?

a. 2000X C. 200X
b. 20X D. 190X

359. Which of the following is not true about epithelial cells? A. They are usually arranged in thin sheets of epithelial tissue

B. They cover your internal and external surfaces of the bodies
C. Skin is made up of epithelial cells
D. Gut, respiratory system, and reproductive system are not all lined with epithelial cells

360. A special type of movement of water through selectively permeable membrane across the concentration gradient is?

a. Active transport C. Osmosis
b. Passive transport D. Diffusion

361. Which of the following reactants and its end products incorrectly matched?

a. Glucose+ glucose maltose +water
b. Glucose+ fructose sucrose +water
c. Glucose+ galactose lactose +water
d. Glucose+ fructose lactose +water

362. Which disease is happening due to lack of protein in our diet?

a. Anaemia
C. Kwashiorkor
b. Rickets
D. Marasmus

363. Which of the following groups are classified as macronutrients?

a. Proteins, minerals, vitamins C. Fats, fibre, folic acid
b. Carbohydrates, proteins, fats D. Carbohydrates, proteins, milk

364. Analyze a reaction which involves the splitting of large molecules in to smaller pieces up on the addition of water:

A. Condensation reaction B. Hydrolysis reaction C. Synthesis reactions D. Combustion reaction

365. Which of the following molecules are the building blocks of proteins?

a. Monosaccharides C. Fatty acids
b. Glycerol D. Amino acids

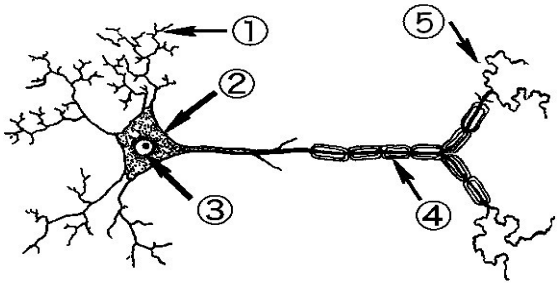
366. Which of the following is evaluate the disease that is not correctly paired with the substance whose deficiency causes the disease?

a. Beriberi –Nicotinic acid C. Scurvy – Vitamin C
b. Night blindness – Vitamin A D. Rickets- Vitamin D

367. Grade 9 students carry out a food test if an unknown food decolorizes DCPIP, the food contains:

a. Vitamin C C. Mineral
b. Carbohydrate D. Protein

368. This item is based on the following diagram of the parts of neurones.



369. What is the name of the neurons part represented by number ‘3‘ in the above diagram?

A. Dendrites C. Myelin sheath
B. Axon D. Nucleus

370. Which of the following is the main structural components of bacterial cell wall?

A. Chitin C. Murine
B. Carbohydrates D. Lipids

371. Which of the following will not cause obesity, even if you eat very large amounts of it in your diet?

A. Fat C. Carbohydrate
B. Fibre D. Protein

372. Which of the following does not evaluate the important jobs of bile?

A. It neutralizes the acid from the stomach and makes the semi digested food alkaline.

B. Ideal for the enzymes in the small intestine, which work most effectively in an alkaline environment.

C. Bile emulsifies the fats in your food – it breaks down large drops of fat into smaller droplets.

D. provides a much smaller surface area of fats for the lipase enzymes to work on to break down the fats completely into fatty acids and glycerol

373. The breaking down of large droplets of fat into small droplets are:

A. Emulsify C. Gall bladder
B. Pepsin D. Sphincter

374. Which of the following is the correct main processes of eating your food involves?
A. Absorption ingestion digestion egestion assimilation
B. Ingestion digestion absorption assimilation egestion
C. Egestion Ingestion digestion assimilation absorption D. Digestion assimilation ingestion absorption egestion. 239. Enzymes are made of:
A. Carbohydrates C. Proteins
B. Vitamins D. Fats

375. Which part of a tooth contains the living nerves?
A. Enamel C. Cement
B. Dentine D. Pulp cavity
376. The most important process in the lungs takes place in the:
a. Pleural cavity C. Brnchioles
b. Alveoli D. Bronchi

377. Which of the following nutrients serve as structural components of cell membrane?
a. Lipids C. Carbohydrates
b. Vitamins D. minerals

378. Which of the following is the main job of the arteries?
a. Carry oxygenated blood to the heart
b. Carry oxygenated blood away from the heart
c. Carry deoxygenated blood to the heart
d. Carry deoxygenated blood away from the heart

379. The grade 9 students they want to know the presence of carbon dioxide in exhaled air. Which of the following method is preferred for breathing on?

a. Glass surface B. Lime water
C. Cobalt chloride paper D. Thermometer

380. When compared with anaerobic respiration, the amount of energy released by aerobic respiration is:

a. Unknown C. Equal
b. More D. Less

381. Which of the following is the importance of breathing through the nose rather than through the mouth?

a. Helps to obtain plenty of air C. Warms and moistens the air
b. Requires less energy to breath D. Helps to take air at faster rate

382. One of the following is the waste products of anaerobic respiration in yeast?

a. Sugar C. Ethanol
b. Water D. Lactic acid

383. Which of the following is incorrect about genetic engineering?

a. It involves changing the genetic material of an organism
b. It is the process of inserting new genetic information into existing cells
c. It provides new trait which people want to see
d. It doesn’t involves altering the genetic material of an organism

384. Which particular fungus used to produce mycoprotein:

A. Fusarium venenatum C. Albugo candida B. Agaricus campestris D. Acremonium cucurbitacearum

385. Who is discovered the first model fungal medicine known as penicillin?

a. Robert hook C. Joseph Lister
b. Alexander Feleming D. Walston

386. Which of the following is incorrect about application of biotechnology in biogas production?
a. It helps for the production of biogas
b. The generation of biogas from human and animal waste increasingly important
c. Biogas formed waste products of animals in aerobic conditions
d. Hydrogen sulphide is the components of biogas

387. Almaze want to use ethanol as a fuel for her car. What is the advantage of using ethanol as a fuel than other fuels?
a. It is high pollutant C. Burning of ethanol is carbon neutral B. It takes a lot of plant material D. It requires large space

388. How would you express correctly chromosomes?
a. It is thread like structure found in the cytoplasm
b. It is made up of DNA in a DNA –protein complex
c. The number of chromosomes are the same in all organisms
d. It is the strand of DNA doesn’t carry genetic information

389. Which of the following does not the components of nucleotide?
a. Phosphate group C. Nitrogenous base
b. A pentose sugar D. Lipid

390. Which of the following is the unit of heredity?

a. Gene C. RNA
b. DNA D. Chromosome

391. How would you differentiate meiosis from mitosis?
a. It takes place in somatic cells C. The number of daughter cells are four B. The number of daughter cells are two D. DNA replication always occur

392. If a DNA molecule having 2200 bases has 600 guanine bases. what will be the number of thymine, adenine and cytosine bases respectively?

a. 500 thymine,500 adenine, and 600 cytosine C. 400 thymine,600 adenine, and 600 cytosine

b. 600 thymine,500 adenine, and 600 cytosine D. 500 thymine,500 adenine, and 500 cytosine

393. The central nervous system consists of:

A. Nerve cells and brain C. Sensory receptors and nerve cells

B. Brain and sensory receptors D. Brain and spinal cord

394. Type of neurons carry information from the sense organs to the central nervous system:

A. Relay neurons C. Sensory receptors

B. Motor neurons D. Sensory neurons

395. The junction between two neurons is:

a. Action potential C. Neurotransmitter

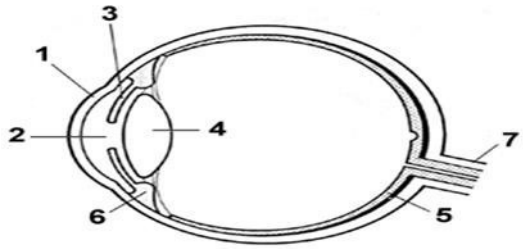
b. Synapse D. Centromere

396. Which of the following diseases does not increase by risk of smoking?

A. Stroke C. Anthrax

B. Lung diseases D. Cancers

397. This item is based on the following diagram of the human eye:



398. What is the name of the human eye part represented by number ‘4‘ in the above diagram?

A. Iris

B. Lens

C. Cornea
D. Sclera

399. Which of the following structure does not used to protect human brain from any injury?

a. Skull C. Meninges
b. Cranium D. Grey matter

400. Which of the following statement is correctly matching the parts of the brain and its function?

a. Hypothalamus –center for regulation of hunger, and thirst
b. Mid brain-consist of center of vision
c. cerebellum –helps for maintenance of body balance and posture
d. Medulla oblongata-coordinates activities memory intelligence

401. Which of the following is correctly evaluates the parts of eye and their particular function?

A. Sclera the tough, opaque tissue that serves as the eye's protective outer layer
B. Cornea transparent structure over the front of the eye that allows light to enter
C. Choroid the middle layer filled with blood vessels that nourish the retina
D. Iris transparent structure over the front of the eye that allows light to enter

402. Almaze face the problem of high water loss and entry of pathogens in her body. Which layer of the skin fall to perform its particular role?

a. Hypodermis C. Dermis
b. Epidermis D. Hamme

403. Which of the following human hormone works in preparing the body for stressed, angry, excited or frightened situation?

A. Luteinizing hormone
B. Thyroxine hormone
C. Parathyroid hormone
D. Adrenaline hormone

404. Which of the following is incorrect about insulin and glucagon?
   a. Both are responsible for regulation of blood sugar level
   b. The target organ for insulin and glucagon is the liver
   c. Insulin converts excess glucose in the blood into glycogen and glucagon converts a stored glycogen into glucose
   d. Glucagon converts excess glucose in the blood into glycogen and insulin converts a stored glycogen into glucose

405. The study of the origin and evolution of life is:
   a. Paleobiology C. Physiology
   b. Astrobiology D. Ornithology

406. In an HIV/AIDS community screening, students were asked to take part in voluntary testing. The following discussion presents the views of four grade 12 students named A, B, C and D towards HIV testing.

Student A: I should not take the testing; it is simply boring.
Student B: We should take the testing, since we are educated; we should be exemplary.
Student C: If we get tested and got positive, what should we do? So, let us not get tested.
Student D: You know; this HIV/AIDS testing is simply a business. We should not be cheated. Which student do you think is correct?

   A. Student B C. Student A
   B. Student D D. Student C

407. A biologist who wants to study the effect of sunlight on plants set up an experiment. Plant D gets sunlight; plant E gets no sunlight each day. Which plant is the control group?

   A. Plant E C. No plant
   B. Plant D D. Plant D and E

408. Which one of the following pairs of biological tools and their functions is incorrect?
   A. Pitfall trap-used to collect crawling animal from the ground

B. Sweep net-is used to collect flying insects from long grasses
C. Funnel- used to collect insects from the soil
D. Potter- used to collect insects from the soil

409. The grade 11 students want to measure the height of trees that are found in pharo school Homosha. Which particular tool is preferred for their field work?

A. GPS C. Flow meter
B. Theodolite D. Data logger

410. Which of the following feature does not evaluate the types of microscope and its function?

A. Electron microscopes can only be used in the laboratory
B. Some light microscopes can be used in the ¬field
C. Light microscopes give better magni¬fication than electron microscopes
D. Light microscopes were invented before electron microscopes

411. Now a day the government of Ethiopia is experiencing challenges due to growing population. All are the contributions of biologists using their biological knowledge to maintain the number of population and food supply except one?

A. Developing crop plants with an increased yield
B. Giving advice on the most effective programmes of contraception
C. Developing crop plants that are resistant to disease
D. Developing crop plants easily exposed for different weeds

412. Which one of the following does not the chemical formula of inorganic compound?

A. NaCl C. H_2O
B. NH_3 D. $C_{12}H_{22}O_{11}$

413. Which of the following is incorrect about the property of the water? A. It is the vital constituent of a living cell
B. It is a medium of chemical reaction
C. The only to exist in three state

D. It has less heat of vaporization

414. Which of the following groups are all monosaccharides?

A. Maltose,fructose and sucrose C. Sucrose,glucose and galactose
B. Glucose,fructose and galactose D. Maltose,fructose and galactose

415. Which of the following group of monosaccharaides are all aldoses?

A. Dihydroxy acetone, Fructose and Ribose C. Dihydroxy acetone, Ribulose and Fructose B. Glyceraldehyde, Ribose and Fructose D. Glyceraldehyde, ribose and galactose

233. Which of the following is a bond that holds two monosaccharide units together?

A. Ionic bond C. Glycosidic bond
B. Hydrogen bond D. Ester bond

416.How do lipids different from carbohydrates?

A. Have much less oxygen C. Are organic molecules
B. Have much more oxygen D. Have much more carbon

417.Among the following organic molecules identify the one that does not contain nitrogen?

A. Sphingolipid B. Protein C. DNA D. Chitin

418. A short length of DNA molecule has 100 thymine and 100 guanine bases. The total number of nucleotide in the DNA fragment is:

A. 200 C. 600 B. 400 D. 800

419. Which of the following are incorrectly evaluate food and its method of test?

A. Biuret test-protein C. Iodine test-starch
B. Benedicts test-starch D. Emulsion test-lipid

420. 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. thicker layer of the capillaries
b. the small surface area of the alveoli.
c. difference in the concentration gradient of oxygen and carbon dioxide
d. difference in the molecular size of oxygen and carbon dioxide.

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

422. The following is a list of functions of the components of blood.
1 Transport of oxygen
2 Fight against diseases
3 Cause blood clotting

423. Which one of the following is a correct order of blood components responsible for the above functions respectively?
A. Red blood cells, white blood cells, platelets
B. Red blood cells, platelets, white blood cells
C. White blood cells, platelets, red blood cells
D. Platelets, white blood cells, red blood cells

424. What is the cause of the back flow of blood into the atria from the ventricles? It could be damage of the

A. pulmonary vein. C. aorta. B. valves. D. pulmonary artery

425. The capillaries are blood vessels that have thin wall and large surface area since their function is

A. to return blood to the heart.
B. transport of deoxygenated blood
C. transport of oxygenated blood.
D. exchange of substances.

426. Breakdown of the thick spongy wall of the uterus at the end of the menstrual cycle is associated with the

i. decrease in progesterone and estrogen concentration
ii. increase in oestrogen and progesterone concentration.
iii. formation of the corpus luteum.
iv. Maturation of the follicle

427. The first incubation period of HIV is characterized by a duration of

A. 3-12 weeks when mild symptoms are manifested
B. 2-3 years for the progress of infection to AIDS
C. 20 years before all the symptoms appear in well-nourished people
D. 2 weeks to produce enough antibodies

428. Which one of the following is a behavioral method of temperature regulation in homoiotherms?

A. Aestivation C. Piloerection
B. Vasodilation D. Licking

429. What will happen if the water content of the blood is too high

a. Osmoreceptors stimulate pituitary gland to release ADH
b. The kidney reabsorbs more water back into the blood
c. The second coiled tubule of the kidney becomes more permeable
d. Antidiuretic hormone secretion decreases

430. The movement of water from the roots up to the top leaves of tall trees is carried out by

A. the low cohesive and adhesive forces of water in the xylem.

B. active transport in both the roots and leaves

C. loss of water by transpiration and its replacement by osmosis.

D. active transport in the roots and osmosis in the leaves

431. When three fatty acid molecules and a glycerol molecule undergo condensation reaction, they form

A. glycosidic bond and polysaccharide C. peptide bond and protein.

B. phosphate bond and phospholipid D. ester bond and triglyceride

432. Suppose three potato cylinders were kept in 25%, 15% and 5% sucrose solution respectively and a fourth cylinder was placed in distilled water. Which of the cylinders will be more flaccid? The cylinder in

E. distilled water G. 5% solution

F. 25% solution H. 15% solution

433. During baking of injera, the CO2, produced by yeast is used to

A. bake injera with low temperature.

B. increase the shelf life of injera.

C. kill contaminants that spoil injera.

D. give injera its typical texture

434. The nerve impulse is transmitted from one neuron to another neurotransmitter at the by a

a. synapse. C. myelin sheath.

b. axon. D. cell body.

435. What happens if the axon is stimulated? Formation of

a. positive charge inside the axon

b. positive charge outside of the axon

c. negative charge in both sides of the axon

d. negative charge inside the axon

436. 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. Bending up your friend's leg followed by downward movement of the leg
b. Hitting your friend below the knee cap followed by a sudden upward movement
c. Pulling down your friend's leg that is followed by downward movement
d. Hitting your friend on the toes followed by sudden upward movement of the leg

437. 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. Centripetal force
b. Gravitational force
c. Cohesive force
d. Adhesive force

438. The importance of stains in microscopic investigations is explained by their effect in

a. increasing magnification. C. increasing resolution.
b. decreasing air bubbles. D. creating contrast

439. One of the following problems can occur if the liver does NOT properly carry out its digestive functions

a. Partial absorption of digested foods
b. Partial digestion of fats
c. Increased alkalinity of the intestine
d. Incomplete digestion of polysaccharides

440. Which of the following is the correct order of food substance, enzyme, and breakdown product of the digestive process in the stomach respectively?

a. Protein, pepsin, amino acid

b. Lipid, amylase, fatty acid
c. Starch, lipase, glucose D. Fat trypsin, glycerol

441. 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. Inhalation and contraction of the diaphragm
b. Exhalation, and relaxation of the diaphragm
c. Exhalation and contraction of the diaphragm
d. Inhalation and relaxation of the diaphragm

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

443. 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 nosewhile the other without holding the nose and tasting the food

Student 2: Blind folded one student and the other left with open eyes, bothholding 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?

E. Student 4 G. Student 3
F. Student I H. Student 2

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

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

446. 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 A C. blood group B
   b. Blood group All D. blood group O

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

449. Which one of the following diseases increases the likelihood of contracting HIV
   a. Tuberculos C. Chancroid
   b. Syphilis D. Gonorrhoea

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

451. Which one of the following statements is correct about the binomial nomenclature?
   a. The first letter of genus name is capitalized while the species name is written in small letters

b. The genus name is written in English while the species name is B written in Latin
c. The genus name is written in full while the species name is abbreviated
d. Both genus and species names are capitalized and italicized when printed.

452. 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. soil conservation
B. plant conservation.
C. Microorganism conservation
D. animal conservation

453. In kingdom animalia, which phylum poisons its prey by tentacles that contain stinging cells?

a. Annelida C. Nematoda
b. Coelenterata D. Porifer

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

455. 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. Herrings C. Phytoplankton
b. Sea lions D. Zooplanktons

456. Which one of the following is an adaptation to reduce water loss in plants? Having

a. large and wide stomata
b. leaves covered with waxy cuticle
c. a single layered epidermis in leaves
d. thin broad leaves

457. Why are arctic animals such as seals, walruses and whales large in body To
a. capture their prey without challenges
b. increase their surface area
c. reduce heat loss
d. move in the water bodies easily

458. 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. genotypically identical but phenotypically different from the parent.
B. phenotypically identical but genetically different from each other
C. phenotypically and genotypically different from the parent plant and from each other.
D. genetically and phenotypically identical to the parent plant and to each other.

459. This item is based on the comparison between aerobic and anaerobic respiration in animal provided in the table below.

Aerobic respiration	Anaerobic respiration
Oxygen dependent	Oxygen independent
Produces more ATP	Produces less ATP
Takes place in cytoplasm and	Takes place in cytoplasm

mitochondria	
Produces CO2, H2O and energy	Produces “A”

In the above table, “A” stands for

B. Amino acid and energy B. CO2 and energy C. lactic acid and energy D. CO2, alcohol and energy

460. Which of the following occurs during inhalation of air?

C. Relaxation of the diaphragm C. Movement of the ribs out and up

D. Relaxation of the external intercostal muscle D. The diaphragm becomes dome shaped

461. What do we call animals which have body temperatures that varies with the external environment?

B. Poikilotherms B. hibernators C. Homiotherms D. aestivators

462. Which of the following parts of the body is different from the rest in relation to homeostasis?

i. Kidney B. heart C. skin D. liver

463. Vaccines that help to protect the body from deadly disease are produced from

B. Antibiotics B. medicinal plants C. extract of tablet D. weakened pathogen

464. Which of the following is advisable with regard to the use of medicine?

A. Children can be given medicine prescribed for adults for similar symptoms.

B. Self – prescription of medicine based on previous history.

C. Finishing the prescribed dose even if the symptoms are gone.

D. It is bad to take overdose of a medicine but taking under dose is not a problem.

465. A chemical agent that is applied on a living tissue to kill microorganism is

i. Disinfectant B. Antiseptic C. Sterilizer D. Autoclave

466. Which of the following methods of controlling microorganism is done by raising the boiling point of water to 121 0c.

a. Pasteurization B. disinfection C. autoclaving D .dry heat

Which of the following is the function of thyroxin?

b. Conversion of glucose to glycogen C. Control of the metabolic rate

c. Conversion of glycogen to glucose D. Development of sexual characteristics

467. Glands that produce secretions directly to the blood stream are called

B. Exocrine B. Endocrine C. Salivary D. mammary

468. Which of the following is a physical method of contraception?

A. Condom B. Pill C. Implant D. Injection

468. Which of the following statement is correct about female genital mutilation (FGM)? It

C. Helps to make girls pure. C. Makes girls acceptable by males

D. C. Increases exposure to HIV/AIDS D. Helps women to give birth easily

469. If a person has problem of focusing the image behind the retina, which type of lens can be prescribed to correct the problem?

A. Concave B. flat C. scattering D. Convex

470. Parts of breathing system where gaseous exchange takes place is

a. Trachea B. Alveolus C. bronchus D. bronchioles

471. Blood vessels that carry deoxygenated blood from the heart to the lung is called

a. Pulmonary artery B. coronary artery C. Pulmonary vein D. Coronary vein

472. If a plant cell is plasmolyzed, the

A. Cell membrane will be firmly attached on the cell wall
B. Vacuole pushes the cytoplasm toward the cell wall
C. Cytoplasm shrinks away from the cell wall
D. Pressure inside the vacuole increases

473. What do we call a breeding techniques which helps to get a combination of good traits from two different parents?

a. Pure breeding B. group breeding C. Selective breeding D. cross breeding

474. Normal skin color is determined by a dominant aleele “A”. The recessive allele (a) result in albino skin color. If a couple that is heterozygous for the gene want to have children, what will be the chance of having albino child?

a. 50% B . 100% C. 75% D. 25%

475. Which of the following neuron structure is correctly matched with its function?

E. Dendrites - speed up impulse transmission
F. Myelin sheath – insulates nerve fiber
G. Axon- connect neighboring nerve cells
H. Cell body- collects information from axon

476. The canal that connects the middle ear to the throat is

a. Eustachian tube B. tympanium C. trachea D. eardrum

477. Chaltu distarched a variegated plant and expose to light for several hours. Finally He did starch test with iodine solution and blue black color formed only on the green part of the leaf. Which of the following requirements of photosynthesis did she test by the experiment?

a. Carbon dioxide B. Water C. chlorophyll D. Light

478. Supposed a student breathed out several times on cold glass. Then, tiny drops appeared on the glass and were tested using cobalt chloride paper. The test turned the paper into pink color which of the following contents of exhaled air is tested through this experiment?

a. Water vapour B. Carbon dioxide C. Heat D. oxygen

479. Suppose you germinate a bean seed in a school garden. What will happen to the seedling as it emerge from the soil? Its

C. Plumule remain underground C. Cotyledons remain underground D. Side roots emerge above the soil D. Cotyledons emerge above the ground

480. . Which of the following is correct about the movement of organic material in the phloem?

A. Plants use energy to move organic materials through the phloem

B. Phloem tissue is dead and no active transport takes place in it.

C. The movement of organic substance in the phloem is due to transpiration

D. Phloem transport organic materials that are absorbed by the root from the soil?

481. Which of the following divisions of kingdom plantae is correctly matched with its example?

A. Pteridophyta – ferns C. Broyophyta - conifers

B. Angiospermae- mosses and liverworts D. Gymnospermae true flowering plants

482. Which of the following represents the correct use of the binomial nomenclatures developed by Linnaeus?

A. Order name followed by species name

B. Species name followed by order name

C. Genius name followed by order name

D. Genius name followed by species name

483. In klinostat experiment, rotating the cork with a germinating seed could n't stop the root bending down toward gravity and the shoot bending up straight against gravity. This shows that

a. Gravity doesn't have any effect on root and shoot growth
b. Shoot and root are similarly responsive toward the rotating cork
c. Roots are positively geotropic and shots arte negatively geotropic
d. Shots are positively geotropic and roots are negatively geotropic

484. What is the function of the lymphatic system? It

a. Filter out bacteria G. Filter out blood cells
b. transport nutrients H. transport oxygen

485. Where is the convergence point for the metabolism of the building blocks of carbohydrates, lipids and proteins?

B. Cytoplasm B. Krebs' cycle C. Calvin cycle D. ETC

486. Which of the following cellular structures is filled with sugar, mineral ions, and other chemicals dissolved in water?

A. Mitochondrion B.. Chloroplast C. Ribosome
D. vacuole

487. What do we call all the organic materials produced by living organisms?

A. Biomass B. Biogas C. biofuel D. biodiesel

489. If a DNA molecule has 1400 bases from which 400 are adenine. what will be the number of thymine, guanine and cytosine bases respectively?

a. 300, 400, and 300 C. 300, 300, and 400
b. 400, 300, 300 D. 300, 350, 350

490. The energy that is generated from organic wastes through fermentation is

a. Hydro power B. Solar energy
C. geothermal D. Biogas

491. Which of the following are benefits of using mycoproteins as food?

A. It has low fat content C. It produce high calorie protein

B. It is commercially available everywhere D. It is the cheapest technology ever

492. In the following aquatic food chain, which organism is incorrectly matched with its relative positions?

Phytoplankton → zooplankton → fish → man A. Zooplankton – 2nd trophic level

B. Fish – secondary consumer

C. Phytoplankton – primary consumer D. Man - 4th trophic level

493. In an aquatic ecosystem the biomass of zooplankton exceeds that of phytoplankton. So how does the food chain remain stable?

A. Under such condition the phytoplankton feed on zooplankton,

B. Such food chain doesn't at all exist in reality

C. The number of phytoplankton should exceed that of zooplankton

D. The energy contained in phytoplankton is more than that of zooplankton

494. Any close relationship between two organisms in which one organisms live near, on or even inside another organism and in which at least one organism is benefited is known as:

A. Mutualism B. competition C. symbiosis D . parasitism

495. The characteristic of soils which have direct or indirect effect on organisms distributions are:

A. Edaphic factor B. climatic factor C. biotic factor D. Physiographic factor

496. The common characteristics of Fishes, amphibians, reptiles birds and mammals are:

A. Variable body temperature C. Egg lying B. constant body temperature D. presence of backbone

497. Plant groups don't possess true leaf stem and roots are:

A. Gymnosperms B. angiosperm C. bryophytes d. pteridophytes

498. Why mammals are considered as the most successful animal?

A. Sexual reproduction
B. Adapted to aquatic environment
C. Regulate their body temp.
D. Are the first animal to colonize the land

499. Which of the following groups of animals has the largest number of species?

B. Mollusca B. arachnid C. annelids D. insects

500. Nearly all single celled prokaryotes that are either hetrotrophic or photosynthetic belongs to the kingdom

B. Fungi B. Animalia C. Plantae D. protesta

501. Monocotyledon differ from dicotyledon by having

a. Parallel leaf venation C. presence of vascular cambium
b. Tap root system D. two cotyledon

502. The five kingdom system of classification, organisms are classified based on the similarity of:

E. Analogous structure G. artificial breeding
F. Homologous structure H. the functions of body parts

503. Groups of organism that can interbreed successfully with one another to produce fertile offspring are grouped under the same:

A. Kingdom B. genus C. species
D. phylum

504. Which of the following pathway is correct with increasing its complexity

a. Genus→ order → phylum → kingdom B. Phylum → kingdom → genus → order

C. Kingdom → genus → order → phylum

D. Order → Phylum →Genus →kingdom

505. All of the following are placental animals exept

B. Caw B. Kangaroo C. Dog D. elephant

506. The most intelligent groups of all vertebrates are found in the phylum

B. Nematode B. Annelida C. mollusk D. arthropoda

507. Phyla of kingdom animalia that contain all vertebrate animals is

B. Porifera B. chordates C. mullusca D. arthropoda

508. The simplest of all invertebrates are

A. sponges B. cnidarians round worm D. segmented worms

509.The most numerous interm of species in kingdom of animal are the

B. Arthropods B. Nematodes C. mollusks D. chordates 510. Which of the following taxonomic groups contaion closely related organisms?

B. Genus B. Order C. phylum D . Class

510. The most dominant plant on earth A. gymnosperm B. Angiosperm C.mosses D. Ferns

511. When a baby is born with antibody from the mother. This is an example of

E. Natural passive immunity G. natural active immunity

F. Artificial active immunity H. artificial passive

512. Special proteins produced by the white blood cells to fight infectious microorganisms are

B. Pathogens B. Antigens C. Antibodies D. Vectors

513. Human parasitic worm which uses snail as its intermediate host is

A. Hook worm B. ascaris C. tape worm D. Biliharzia

514. The correct order of stages in mitosis are

A. Metaphase → anaphase → telophase → prophase
B. prophase → anaphase → telophase→ metaphase
C. Metaphase → telophase→ anaphase→ prophase
D. prophase → Metaphase → anaphase → telophase

515. The two halve of replicated chromosomes are called

B. Spindle fiber B. chromatids C. centromere D. centrioles

516. During cell division centrioles form

A. Spindle fiber B. nucleus C centromere D. nucleotides

517. Which part of the eye regulates the size of the pupil?

A. Retina B. Scelera C. Iris D. Lens

518. Which of the following national parks contain endemic wildlife of Ethiopia such as walia ibex and chilada baboon

A. Gambela National Park C. Nechsar National Park D. Simian Mountain National Park
B. Bale Mountain National Park

519. Which of the following stains may be used to study only plant cells?

B. Iodine B. Acetocarmine C. Haematoxylin
D. Methyelene blue

520. The Ethiopian biological research institutes which is conducting research on leprosy and other disease is

C. Armauer Hansen research institute C. Aklilu Lema institute of pathobiology
D. Institute of biodiversity conservation D. institute of agricultural research