MILLENNIUM SECONDARY AND PREPARATORY SCHOOL 2012 E.C GRADE 12
BIOLOGY OPEN BOOK MODEL EXAM -ONE

CHOOSE THE CORRECT ANSWER FROM THE GIVEN ALTRNATIVES

1. Protein and lipid synthesis takes place in _____and _____respectively.

A. lysosome, mitochondria B. mitochondria and rough ER

C. rough and smooth ER D. smooth ER and Golgi body

2. Plant cells will become plasmolysis in

A. hypertonic solution B. isotonic solution C. hypotonic solution D. dilute solution

3. unlike lipids, carbohydrates

A. contain nitrogen B. have high proportion of oxygen atom per molecule

C. have higher calorific value D. have oily texture

4. Which one of the following best describes osmosis? It is the net movement of water molecules from

A. hypotonic to hypertonic solution B. hypertonic to isotonic solution

C. concentrated to dilute solution D. a region with low water potential to higher one

5. Which one of the following factors can affect the rate of diffusion in living cell?

A. thickness of membrane B. difference in concentration

C. surface area through which diffusion takes place D. all

6. It true to say that

A. biological membranes are basically made up of phospholipid bilayer

B. phospholipid bilayers are amphipathic in nature

C. the polar phosphate heads of phospholipid bilayer face towards water

D. all are correct

7. The model of cell membrane that seems more defining and receive wide acceptance by most biologists of our time is

A. Singer and Nicholson's fluid mosaic B. Langmuir's lipid monolayer

C. Davson Daneli's sandwich model D. Robertson's unit membrane

8. Unlike prokaryotes eukaryotes have

A. cell wall B. 70s ribosome C. mitochondria D. DNA in continuous loop

9. Plant cells will turgid when bathed in a solution that is

A. hypotonic to the cell B. hypertonic to the cell

C. isotonic to the cell D. isotonic sea water

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

10. Which one of the following measuring unit is more convenient to measure smaller biological molecules and smallest virus?

A. centimeter B. nanometer C. millimeter D. micrometer

11. Which of the following gas was probably absent in the primitive atmosphere of our earth?

A. H_2O B. O_2 C. CO_2 D. NH_3

12. The processes of autolysis and autophagy are best associated with which organelle?

A. lysosome B. mitochondria C. chloroplast D. Golgi body

13. According to the endo smbiont theory the nuclear membrane is derived from the membrane of

A. endoplasmic reticulum B. mitochondria C. chloroplast D. ribosome

14. Rudolf Virchow modified the cell theory proposed by M. Sheldon and Theodor Shwan because they supported the idea of

A. plants are made up of cells B. Spontaneous generation

C. cells retain dual existence D. Animals are made up of cells

15. Which the following structure function pairs are mismatched?

A. lysosome — intracellular digestion B. Ribosome - protein synthesis

C. smooth endoplasmic reticulum — protein modification D. mitochondria — respiration

16. A human cell containing 22 autosomal and a Y chromosome is

A. somatic cell of male B. a sperm cell C. somatic cell of female D. an ovum

17. Homologous chromosomes segregate toward opposite poles of a dividing cell during

A. mitosis B. meiosis I C. meiosis II D. fertilization

18. The stage of photosynthesis where the actual sugar synthesis takes place is

A. photosystem I B. light reaction C. Calvin cycle D. splitting of water

19. How many molecules of O_2 released for every molecule of CO_2 fixed by photosynthesis?

A. 1 B. 2 C. 6 D. 12

20. Light driven electron transport in chloroplast pumps H^+ where?

A. into the stroma B. into the thylakoid space

C. from NADPH to CO_2 D. out of the chloroplast

21. In mechanism, photophosphorylation is most similar to

A. substrate level phosphorylation B. the Calvin cycle

C. oxidative phosphorylation in respiration D. carbon fixation

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22. The light reaction of photosynthesis supply the Calvin cycle with

A. light energy B. CO_2 C. H_2O D. ATP and NADP

23. The final electron acceptor the electron transport chain that function in oxidative phosphorylation is

A. oxygen B. water C. NAD^+ D. pyruvate

24. Most of the ATP produced during cellular respiration is generated by

A. substrate level phosphorylation B. oxidative phosphorylation

C. glycolysis D. transferring phosphate from glucose to ADP

25. The enzyme amylase can break glycosidic linkages between glucose monomers only if the monomers are the α form. Which of the following could amylase break down?

A. glycogen, starch, and amylopectin B. glycogen and cellulose

C. cellulose and chitin D. starch and chitin

26. Which of the following statements concerning unsaturated fats is true?

A. They are more common in animals than in plants.

B. They have double bonds in the carbon chains of their fatty acids.

C. They generally solidify at room temperature.

D. They have fewer fatty acid molecules per fat molecule

27. Which type of organelle is primarily involved in the synthesis of oils, phospholipids, and steroids?

A. ribosome B. lysosome C. smooth endoplasmic reticulum D. mitochondrion

28. Which of the following produces and modifies polysaccharides that will be secreted?

A. lysosome B. vacuole C. mitochondrion D. Golgi apparatus

29. Which of the following is a compartment that often takes up much of the volume of a plant cell?

A. lysosome B. vacuole C. mitochondrion D. Golgi appara

30. Which of the following contains its own DNA and ribosomes?

A. lysosome B. vacuole C. mitochondrion D. Golgi apparatus

31. Which of the following processes includes all others?

A. osmosis B. diffusion of a solute across a membrane

C. facilitated diffusion D. passive transport

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

32. Which of the following statements regarding enzymes is true?

A. Enzymes decrease the free energy change of a reaction.

B. Enzymes increase the rate of a reaction.

C. Enzymes change the direction of chemical reactions.

D. Enzymes are permanently altered by the reactions they catalyze.

33. The active site of an enzyme is the region that

A. binds allosteric regulators of the enzyme.

B. is involved in the catalytic reaction of the enzyme.

C. binds the products of the catalytic reaction.

D. is inhibited by the presence of a coenzyme or a cofactor.

34. According to the induced fit hypothesis of enzyme catalysis, which of the following is correct?

A. The binding of the substrate depends on the shape of the active site.

B. Some enzymes change their structure when activators bind to the enzyme.

C. A competitive inhibitor can outcompete the substrate for the active site.

D. The binding of the substrate changes the shape of the enzyme's active site.

35. Increasing the substrate concentration in an enzymatic reaction could overcome which of the following?

A. denaturation of the enzyme B. allosteric inhibition

C. competitive inhibition D. saturation of the enzyme activity

36. Zinc, an essential trace element for most organisms, is present in the active site of the enzyme carboxypeptidase. The zinc most likely functions as a(n)

A. competitive inhibitor of the enzyme. B. noncompetitive inhibitor of the enzyme.

C. allosteric activator of the enzyme. D. cofactor necessary for enzyme activity.

37. Antiretroviral drug that most probably interfere with the last stage in the HIV life cycle is

A. protease inhibitor B. nucleoside reverse transcriptase inhibitor

C. entry inhibitor D. integrate inhibitor

38. Which one of the following structure is found in a bacteriophage?

A. ribosome B. mitochondria C. cell wall D. none

39. What is the chance to have offspring that show the receive feature from a test cross on the F-1 plant?

A. 25% B. 50% C. 75% 100%

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

40. What is the primary source of essential amino acids for our body?

A. glycolysis B. Deamination C. Our diet D. transamination

41. Succession that starts after a fire destroy the forest is

A. primary succession B. secondary succession C. hydro sere D. all

42. The genetic code is said to be

A. universal B. non overlapping C. degenerating D. all

43. A method of preparing multiple copies of a gene or an organism by introducing it into a living cell is

A. micro propagation B. in vitro cloning C. in vivo cloning D. PCR reaction

44. Phosphorylation process does not happen in

A. glucolysis B. link reaction C . kreb's cycle D. electron transport system

45. Which one of the following process is characteristics of anaphase II of meiosis?

A. synapsis B. separation of sister chromatids

C. crossing over D. separation of homologous pairs

46. What is the genotypic ratio for the cross between RrYy and rryy ?

A. 3RrYy :1rryy B. 1RrYy:1Rryy:1rrYY:1rryy

C. 1RrYy:1rryy D. all RrYy

47. What is the role of denitrifying bacteria the Nitrogen cycle?

A. decomposition B. oxidation of nitrite

C. ammonification D. releasing nitrogen gas to the atmosphere

48. Meiosis II is similar to mitosis in that

A. homologous chromosomes synapse B. DNA replicates

C. the daughter cells are diploid D. sister chromatids separate at anaphase

49. Which one of the following organism is found with the highest number of endemic species in Ethiopia ?

A. amphibian B. bird C. plant D. fish

50. Which one of the following enzyme inhibition mechanism involve the use of the final product of the metabolic pathway to inhibit the first enzyme?

A. feedback inhibition B. end product inhibition

C. competitive inhibition D. A and B are correct

51. Which one the following event does not happen in the Calvin cycle?

A. oxidation of $NADPH_2$ B. photolysis of water

C. regeneration of Rubp D. hydrolysis of ATP

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

52. The main enzyme in C-4 photosynthesis used to fix CO_2 is_____.

A. Pepco B. catalase C. Rubisco D. NADP reductase

53. Which one of the following molecule functionally link the light dependent and independent stages of photosynthesis?

A. pyruvate B. acetyl coA C. $NADPH_2$ D. $FADH_2$

54. Which one of the following process is common for both light reaction and light independent phases of photosynthesis?

A. ATP synthesis B. redox reaction C. ETC D. photolysis

55. DNA replication takes place during

A. prophase || B. S phase of inter phase C. anaphase of meiosis D. cytokinesis

56. Complete meiotic division results in _____

A. 4 diploid doughter cells B. 2 haploid cells C. 2 diploid cells D. 4 haploid cells

57. Which stage of meiosis involve separation of sister chromatids with the breaking down of chiasmata?

A. anaphase I B. prophase II C. prophase I D. anaphase II

58. Which one of the following process defines prophase II?

A. synapsis B. crossing over C. disintegration of nuclear membrane D. all

59. Regarding ABO blood group inheritance in which of the following crossing could a child with AB blood type is produced?

A. AB x OO B. AO x AA C. BB x OO D. None

60. A man with blood type O could not be the possible father for a child that has _____ blood type.

A. A B. B C. AB D. O

61. What is the F-2 phenotypic ratio of monohybrid cross for a trait that show co dominance?

A. 3:1 B. 1:1 C. 1:2:1 D. 9:3:3:1

62. Unlike C-3 plants C-4 plants

A. affected by photorespiration B. have chloroplast in the bundle sheath cell

C. dominant in temperate regions D. produces four glucoses per calvin cycle

63. What do we call the type of dominance if all the off springs from an Rh positive woman and an Rh negative man become Rh positive?

A. complete dominance B. over dominance C. co dominance D. incomplete dominance

64. Which one of the following is wrong about tetrad

A. it contains four chromosome B. it is formed during prophase|

C. it is the result of synapsis D. it contains four sister chromatids

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

65. Multiple allelism is

A. the presence of three allels in an organism for a single trait

B. the presence of multiple allels in the population for one trait

C. a trait that is expressed only in one sex

D. the presence of one gene for multiple traits

66. In which of the following conditions do C-4 photosynthesis is most efficient and advantageous than C-3 photosynthesis ?

A. low CO_2 concentration B. high light intensity

C. high temperature D. all

67. Assume every somatic cell in a given organism contains 24 chromosomes or 12 chromosome paires ,which one of the following is correct about meiotic gametogenesis that take place in this organism?

A. all the gametes formed contain 24 pairs of chromosomes

B. meiosis results in four daughter cell each contain 12 chromosomes

C. gametogenesis results in two daughter cells each of which have 24 chromosomes

D. there are four doughter cells produced containing 24 chromosomes

68. Identify the stage where bivalents are arranged at the mid plate

A. metaphase II B. metaphase I C. anaphase I D. anaphase II

69. What is the source of recombinant traits in linked genes?

A. meiotic crossing over B. independent assortment

C. random fusion of gamet D. binary fission

70. This is the unit of separation in gene mapping using cross over value

A. centimorgan B. kilobase C. micrometer D. centimeters

71. The number of organisms that an environment is capable of supporting with enough resourses and shelter refers to_____

A. age pyramid B. carrying capacity C. natality rate D. demographic transition

72. What do we call the roll of an organism played in it's habitat within the ecosystem?

A. food web B. geographic range C. ecological nich D. biospher

73. Ethiopia is one of the 12 centers of origin of cultivated crops. Which of the following plant has it's centre of genetic diversity in Ethiopia?

A. Enset ventriculum B. Coccinia abyssinica C. Eragostis tef D. all

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

74. The largest number of species and largest percentage of endemic species in our country is represented by _____ and _____ respectively.

A. amphibian, bird B. plant, bird C. plant, amphibian D. bird, reptile

75. Which one of the following ecosystem services is provisioning?

A. spiritual B. water purification C. fresh water D. recreational

76. When did the population size of a country will increase? When

A. natality exceed mortality B. emigration exceed immigration

C. mortality exceed natality D. there is high predation and disease

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MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

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B. the non-polar hydro carbon chain is hydrophilic

C.it contains hydrophobic tails face inwards away from water

D. hydrophilic tail contain phosphate unit

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MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

93.The branched nature of glycogen is the result of .....

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A. secondary protein structure B. H-bonding

C. genetic information in DNA D .hydrophobic interaction

95. It is true to say that

A. polysaccharides are water soluble

B. monosaccharaides have sweat taste polysaccharides not

C. disaccharides and monosaccharide's are ideal storage forms

D. only monosaccharaides have structural role

96.Which one of the following is the main structural component of fungi cell wall and the exoskeleton of insects?

A. cellulose B. chitin C. peptidoglycan D. glycogen

97.Which of the following pairs of protein have a globular shape and hence a functional role?

A. enzyme and collagen B. enzyme and hormone

C. hormone receptor and keratin D. keratin and collagen

98.Which one of the following does not describe animal lipid? it is

A. good for health in excess concentration daily B. rich in saturated fatty acid

C. solid at room temperature D. characterized by high melting point

99. Water has high specific heat capacity that makes it

A. warm up quickly B. cool down quickly

C. warm up and cool down quickly D. warm up and cool down slowly

100. Unlike glycogen, starch

A.is a polymer of beta glucose B. has structural role

C. has extensive branching D. none

101. Catalysis by enzymes alter

A. the nature of final product B. overall energy out put

C. the rate of a reaction D. the nature of the enzyme

102.Enzymes get inactive not denatured when

A.PH increases B. temperature decreases below the optimum

C.PH decreases D. temperature increases beyond the optimum

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

103. Cofactors of a holoenzyme

A. are protein parts B. have catalytic activity alone

C. interferes with the apoenzyme D. needed to activate the apoenzyme

104. According to the modern classification enzymes are classified into six major classes one the basis of

A. substrate B. reaction they catalyze C. shape D. functional group

105. many coenzymes are derived from.....

A. mineral ions B. vitamin C. inorganic substance D. apoenzyem

106. Which one of the following effect can be over come by increasing substrate concentration?

A. allosteric inhibition B. fed-back inhibition

C. competitive inhibition D. non-competitive inhibition

107. Inhibition of enzymes caused by inhibitor that have structural similarity with the normal substrate is called

A. allosteric B. fed-back C. competitive D. non-competitive

108. Assume the ratio of non-competitive inhibitor to substrate molecule is 2:8 the enzyme controlling the reaction will be

A.80% inhibition B.80% activated C.20% inhibited D.1/4 activated

109. Biochemical reaction that involve joining of smaller molecules are catalyzed by a

A. lays B. ligase C. hydrolyses D. oxidoreductase

110. Which one of the following best describes an enzyme inhibitor that destroys the enzyme permanently by binding on its allosteric site?

A. competitive reversible inhibitor B. non-competitive irreversible inhibitor

C. competitive irreversible inhibitor D. non-competitive reversible inhibitor

111. What is meant by enzymes are specific

A.one enzyme can catalyze several reaction

B.one reaction can be catalyze only one type of reaction

C.one reaction can be catalyze by several enzyme

D. different substrate can be acted by a specific enzyme

112. What will happen to the rate of enzyme catalyzed reaction, if the substrate concentration increases with out altering enzyme concentration?

A. increase initially and become constant C. decrease quickly all the time

B. increase quickly all the time D. increase initially and become zero finally

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

113. Which one of the following does not describe end peoduct enzyme regulation mechanism of a cell?

A. allosteric regulation B. fed-back inhibition

C. competitive inhibition D. non-competitive inhibition

114. Which one of the following is an autotrophic ekukaryote?

A. algae B. cyanobacteria C. yeast D. protozoa

115. Chemical reactions denoted as AB+C.....A+CB are catalyzed by enzyme grouped under

A. hydrolyses B. lyase C. transferase D. isomerase

116. Which one of the following best describe gram positive bacteria?

A. thick cell wall B. resistance for most antibiotics

C. endotoxin production D. stain in gram reaction

117. The difference in gram reaction is mainly due to

A. presence of plasmid B. thickness of cell wall

C. nature of cell membrane D. shape of bacteria

118. Which one of the following process is performed by ammonifying bacteria?

A. dentirification B. decomposition C. nitrification D. nitrogen fixation

119. Ammonia is oxidized into nitrite in the presence of

A. pseudomonas B. nitosomonas C. rhizobium d. nitrobacter

120. Plants can absorb and utilize sulohur from the soil when it is in the form of

A. sulphate B. sulphite C. hydrogen sulphid D. sulphuric acid

121. Which one of the following is not an infectious diseases?

A. tuberculosis B. syphilis C. atherosclerosis D. athlete foot

122. Degenerative disease are result of

A. lack of nutrient B. working condition C. pathogens D. aging process

123. Which one of the following is the major method of transmission for organisms that cause respiratory disease of air ways?

A. eating contaminated food B. physical contact C. droplet infection D. sexual intercourse

124. Which one of the following serves as a reservoir of infection for clostrium tetani?

A. food B. soil C. water D. human being

125. Which one of the following is used to describe an infectious agent that casuse communicable disease?

A. pathogen B. vector C. reservoir of infection D. propage

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

126. In the carbon cycle, which one of the following processes does not return carbon dioxide into the atmosphere?

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

127. Which one of the following function best at lower PH than all the rest?

A. salivary amylase B. intestinal protease C. pepsin D. intestinal lipase

128. The reverse transcriptase enzyme of retroviruses is best defined as

A. DNA polymerase B. RNA polymerase C. endonuclease D. helicase

129. Which one of the following is found in nucleic acid?

A. calcium B. iron C. magnesium D. phosphate

130. Which model of enzyme is preferred by most biologists because it explain enzymes as a flexible protein?

A. the induced fit model B. the lock and key model

C. the rack model D. the strain model

131. In genetic engineering process what does the restriction endonuclease enzymes do?

A. restrict transcription B. cut DNA at specific site

C. revers transcribe DNA D. join nucleotides

132. Which one of the following stage of the scientific method describe the activity performed by biologist trying to find if anyone else has already involved in the same investigation?

A. hypothesis B. result recording C. background research D. experimentation

133. Which one of the following refer to the reasoning technique in science where general principles are used to analyze specific ideas?

A. induction B. deduction C. pseudo deduction D. pseudo induction

134. One of the following is true about protein ,which one is it

A. they are all 20 amino acids long B. they are all globular in shape

C. they perform the same function D. their monomers are held together by peptide bond

135. Which class of enzymes catalyze a chemical reaction that involve joining of two molecules ?

A. lyase B. ligase C. transferase D. hydrolyase

136. In the formation of macromolecules what is the type of reaction that join the monomers together?

A. hydrolysis B. dehydration synthesis C. denaturation D. hydrophobic reaction

137. The viral life cycle that involve genetic alteration of the host cell by forming a prophage is best described as

A. lytic B. lysogenic cycle C. virulent phage D. chronic release

MILLENNIUM SCHOOL OPEN BOOK EXAM - ONE

138. What is F-2 phenotypic ratio of a dihybrid cross?

A. 1:1 B. 3:1 C. 9:3:3:1 D. 1:2:1

139. Assume a dihybride cross test cross produce offspring's all with the same phenotype and genotype, this is because the original were

A. homozygous for both B. heterozygous for both

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