SCHOOL OF INDIANA

HOME OF VISIONARIES

BIOLOGY MODEL QUESTIONS

1. The advantage of antiretroviral combination treatment (HAART) over a single drug treatment is that, HARRT**;**

A. target the different HIV viruses to cure the patient.

B. targets the different HIV viruses and kill at the same time.

C. targets the different HIV viruses multiplication and kill at the viruses at the same time.

D. targets the different HIV viruses multiplication stages and reduces viral replication cycle.

2. Which part of a report writing on an experiment used to describe honestly the limitation of the procedure and pointing out unavoidable limitations and inaccuracies that have been observed during experimentation**?**

A. Conclusion. B .Acknowledgement. C. Evaluation. D. Result.

3. The most likely independent variable tasted by Louis Pasteur when disproving spontaneous generation was**?**

A. Bacterial growth. B. Broth (nutrient media). C. Shape of flask. D. Bacteria.

4. An odd result that does ***not*** fit the general pattern in our experiment is**;**

A.confounding factor. C. anomalous result.

B. controlled variable. D. confirmed prediction.

5.A successful scientific experiment will result only in:

A. Rejection of one or more hypotheses C. Proving a hypothesis

B. Accepting many hypotheses D. Confirming predictions

6.One of the following biological apparatuses is unique among the others, which?

A. burette B. syringe C. Measuring cylinder D. centrifuge

7. A biologist wants to investigate the role of growth hormones in human babies. Two groups of human babies are established- one receives the injection of growth hormone in oil, the other groups just receive an injection of oil. The group receiving only an injection of oil is called

A. experimental group B. placebo C. control group D. observational group

8. Based on the above question to increase the reliability of the experiment;

A. carrying out repeating experiments B. using the most appropriate apparatus

C. working as quickly as possible D. minimizing personal judgement

9. The "scientific method" involves all of the following except

A. Imagination and insight C. A rigid set of logical steps

B. An educated guess D. A suspicion of what the truth might be

10. Which one is the 3rd step of scientific method?

A. Ask question. C. Do back ground research

B. Construct hypothesis. D. Test with an experiment.

11. Compounds closely related to polysaccharides that form the cellwall of fungi and exoskeleton of the arthropods is**:**

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

12. The glycosidic bond does ***NOT*** occur in the synthesis of**:**

A. oligosaccharides B. disaccharides C. monosaccharide D. polysaccharides

13.A student tested a food sample for the presence of one food item and wrote the results of his/her experiment in his/her note book, **''**I saw a white emulsion in the test tube,**''** which food type had a student correctly identified**?**

A. reducing sugar B. lipids C. proteins D. unknown

14. In mammal animals, much of the body lipid is stored under the skin of the animals which animals to keep the body warm as well as energy storage, this is served as**:**

A. components of cell membrane C. thermal insulation of heat

B. components of some hormones D. components of some enzymes

15. Which one of the following is ***NOT*** true about a sucrose molecule**?**

A. it is a combination of glucose &fructose C. it is reducing sugar

B. it is a double sugar D. It is sweet

16. If more carbohydrates are eaten by animals the excess carbohydrate is converted in to**:**

A. animal sugar B. animal starch C. glycogen D. all are correct

17. Which of the following nitrogenous bases in RNA molecules are ***NOT*** correctly paired**?**

A. adenine &thymine C. guanine &cytosine

B. cytosine & guanine D. uracil & adenine

18. Which one is ***miss-matched*** about chemical elements which do have specific functions in biological system**?**

A.phosphorus➔digesting food C. iron➔ haemoglobin

B. calcium➔muscle function D.florine➔teeth enamel

19. Water stores heat helps to maintain a constant internal body temperature, this property is**:**

A. high surface tension C. transparent

B. excellent solvent D. high specific heat capacity

20. Simple sugars are similar to double sugars in that both are:

A. Sweet B. water insoluble C. not crystalline D. they are branched

21. Lactose is derived from:

A. β- glucose molecule and α- galactose molecule

B. β- glucose and β- galactose

C. α- glucose molecule and β- galactose molecule

D. α- glucose molecule and fructose

22. Which one of the following lipids is secreted by epidermal cells of some plant leaves?

A. Phospholipids B. triglycerides C. waxes D. glycolipids

23. Which one of the following is the most abundant bio chemical molecule?

A. Cellules B. Starch C. Glycogen D. chitin

24. Which of the following functional groups form an ester bond through condensation reaction?

A. PO4 and COOH C. COOH and NH2

B. COOH and OH D. OH and OH

25. Which of the following groups of substances are all inorganic?

A. Water, sugar, calcium, carbonate C. Sugar, fatty acid, amino acid

B. Water, calcium carbonate, carbon dioxide D. Carbon dioxide, amino acid, fatty acid

26. Which test is suitable for checking the presence of protein in foodstuffs?

A. Biuret test B. Benedict's test C. Emulsion test D. Iodine test

27. A high heat of vaporization means

A. A loss of large amount of heat. C. A loss of less amount of heat.

B. A loss of large amount of water D. A loss of less amount of water .

28. Which one is the second abundant element in living cells?

A. Nitrogen B. Carbon C. Hydrogen D. Oxygen

29. Which of the following proteins have a quaternary structure?

A. Hemoglobin B. Myoglobin C. enzyme D. Keratin

30. What is common to all fatty acid molecules?

A. Hydroxyl group B. Carboxyl group C. Carbonyl group D. Amino group

31. Which class of enzyme change of the molecular form of the substrate?

A. Ligase B. Isomerase C. Lyase D. Hydrolase

32. The enzyme that has wide industrial application in starch, textile industries and in the making of biological detergents is**;**

A. lipase B.trypsin C. amylase D. lactase

33. Equal amount of starch solution was placed in three test tubes [**A, B** and **C** test tubes].then equal amount of salivary amylase was added to each test tube. Tube A was kept at 67^0C,tube B at 37^0C and tube C at 0^0C.the tube that give positive test for reducing sugar is**;**

A. tube C B. tube A C. tube A and B D. tube B

34. **E**,**S** and **P** stand for **E**nzyme, **S**ubstrate and **P**roduct respectively. In an enzyme catalyzed reaction, the correct mechanism is**;**

A. **E+S+P** ↔**ESP-**complex↔ **E+S+P.** C. **E+S**↔**ES-** complex ↔**S+P.**

B. **E+S**↔**ES-**complex↔ **E+P.** D. **E+P**↔**EP-**complex ↔**S+P.**

35. If the ratio of competitive inhibitor molecules to substrate molecules is **60:40**, the enzyme controlling the reaction will be**;**

A. 100% inhibited. B. 60% activated. C.40% inhibited. D.60% inhibited.

36. An enzyme could be**;**

A. a part of the product. C .a part of substrate.

B. neither part of substrate nor product. D . attach to a substrate

37. As pectinase is to clarify fruit juice _____enzyme is to produce a white paper.

A. cellulase B. biochymosin C. pulmozyme D. xylanase

38. Which of the following is **<u>not</u>** true about enzymes**?**

A. During catalysis enzymes attach to substrates

B. An enzyme can be use over and over again

C. Extreme high temperature affects enzyme activity

E. Enzymes are specific in their action.

39. If an enzyme is provided with its normal substrate plus another molecule having the same and size as the substance, which one of the following would happen?

A. Allosteric inhibition C. Competitive inhibition

B. Irreversible inhibition D. End product inhibition

40. Which of the following pairs of molecules are known to have catalytic activity?

A. Lipids and proteins C. Carbohydrates and proteins

B. Protein and RNA D. Protein and DNA

41. Which of the following is not a coenzyme?

A. vitamin B. FAD C. CU^{++} D. protein

42. Enzymes generally have;

A. different PH but same optimum temperature

B. different pH & different optimum temperature

C. same PH & same optimum temperature

D. same PH but different optimum temperature

43. The inhibition caused by competitive inhibitors **cannot** be overcome by:

A. Increasing the concentration of the substance

B. Decreasing the concentration of the substance

C. Reducing the concentration of the inhibitor substance

D. To constant substrate concentration.

44. At which structural organization are globular proteins found?

A. Primary B. secondary C. Tertiary D. Quaternary

45. If the enzyme concentration is kept constant and the substrates are supplied in excess, the rate of enzyme catalyzed reaction will be:

A. stays the same. C. Increase and then decrease.

B. Increase and then level off. D. Increase.

46. HIV virus belongs to the class of;

A. Rhinoviruses. C. Retroviruses.

B. Adenoviruses. D. Tobacco mosaic viruses

47. The main groups of unicellular eukaryotic microorganisms that are neither plants nor animals but can obtain its nutrition using extra cellular digestion are**:**

A. Viruses. B. yeasts. C. bacteria D. Protozoa

48. Identify the ***wrong*** statement from the following alternatives**:**

A. Not all bacteria have flagella. C. Not all bacteria have ribosome.

B. Not all bacteria posses a capsule. D. All bacteria have cytoplasm.

49. The microbial world that contains DNA or RNA as the genetic materials**,** no means of energy production**,** cannot reproduce itself directly outside living host cells.” This statement describes**:**

A. Sandy flies. B. Plasmodium. C. Virus. D. Amoeba.

50. A type of viral life cycle that can replicate and produce a few viruses by altering their host genomes' without killing them are**:**

A. lysogenci life cycle. C. lytic life cycle.

B. Chronic release life cycle. D. Ongoing release life cycle.

51. Which one of the following alternatives is ***not*** a vector borne disease**?**

A. Leshimaniasis. B. Malaria C. Pneumonia D. Sleeping sickness.

52. One of the roles of bacteria in industrial process is production of vinegar using ***acetobacter***. During the process, the role of bacteria is**:**

A. Fermenting the alcohol. C. Oxidizing the alcohol to ethanoic acid.

B. Eutralizing the alcohol. D. Reducing the alcohol to ethanonic acid.

53. Plants do not genetically modified by *Agrobacterium tumefaciens* that can be modified by using of:

A. Plasmid B. Gene gun C. Virus D. Bacteria

54. Why T-lymphocytes are more vulnerable to **HIV** infection**?** because they possess**:**

A. Large pores in their cell membrane. C. gp120 on their surface.

B. Thin cell membrane. D. HIV receptor protein.

55. Which one is the correct direction of transfer of genetic information in **HIV?**

A. Protein➔DNA➔RNA. C. DNA➔Protein➔RNA.

B. DNA➔RNA➔Protein. D. RNA➔DNA➔RNA➔Protein.

56. Which of the following infectious diseases correctly matched with its causative agent**?**

A. Farmer's lung➔bacteria. C. Tuberculosis➔virus.

B. Malaria➔protozoa. D. Polio➔fungus.

57. Identify the ***wrong*** statement from the following options**:**

A. G^+ bacteria have additional outer membrane around their cell wall.

B. G^- bacteria have additional outer membrane around their cell wall.

C. G^+ bacteria have thick peptidoglycan layer in their cell wall.

D. G^- bacteria have thin peptidoglycan layer in their cell wall.

58. Vinegar solution is a good way of food preserving method. So the method of preserving foods using vinegar solution is known as**:**

A. Drying. B. Freezing. C. Pickling. D. Heating.

59. In the sulphur cycle, sulphur is released by decomposition of sulphur contained proteins of dead bodies of organisms as <u>*hydrogen sulphide*</u> (H_2S) by;

A. Chemosynthetic bacteria. C. The genus *desulphovibrio.*

B. The genus *thiobacillus.* D. photosynthetic sulphur bacteria.

60. Which group of bacteria reduces *nitrates* to *nitrogen gas* in the nitrogen cycle**?**

A. Nitrogen fixing bacteria. C. Ammonium ion forming bacteria.

B. Denitrifying bacteria. D. Photosynthetic bacteria.

61. Which of the following groups of bacteria consists of spherical *shaped* cells**?**

A. G+ bacteria B. cocci C. baccili D. Spirilla

62. Anti-HIV/AIDS clubs are today common in schools, colleges and universities. What is their main contribution in the fight against the pandemic?

A. Raise awareness about the problem among the students.
B. Encourage the girls to have boyfriends.
C. Provide medication for AIDS patients.
D. Encourage the boys to have girl friends.

63. The term '*protozoa*' usually defined as:

A. motile prokaryotic uni-cellular protest.
B. motile prokaryotic uni-cellular photosynthetic protest.
C. motile eukaryotic uni-cellular protest.
D. non-motile eukaryotic multi-cellular protest.

64. Which of the following would **not** be found in the capsid of a virion?

A. DNA B. Enzymes C. Chromosomes D. RNA

65. Which groups of anti-retroviral inhibitors preventing the assembly of new virus particles?

A. Protease inhibitors. C. Integrase inhibitors.
B. Entry inhibitors. D. Nucleotide reverse transcriptase inhibitors.

66. Bacteria can transfer genes to other bacteria. A gene unique to bacterium 'X' is transferred to bacterium 'Y'. Which of the following will be most likely result?

A. Bacterium 'Y' will develop new traits.
B. Bacterium 'Y' will be poisoned
C. Bacterium 'Y' will change in to bacterium 'X'
D. Bacterium 'X' is transgenic organism.

67. All the plants, animals and micro-organisms naturally occur together in a given habitat make

A. a population B. an ecosystem C. a community D. the biome

68. Which one of the followings can be good reason for the need of nutrient recycles in nature?

A. Nutrients are in excess in any ecosystem
B. Nutrients are limited in quantities in nature.
C. Nutrients are non-renewable.
D. Nutrients are found in abundant.

69. In the age pyramids of developing countries many individuals can be found approximately between the ages of:

A.25-30years B. 0-11 years C. 60-70 years D. above 80 years

70. Identify the correct statement.

A. Energy recycles in nature.
B. Both energy and nutrients are transferred through feeding.
C. Nutrients have not recycling in nature.
D. Both energy and nutrients recycle

71. Which one of the following marine biome is unique habitat due to the mixing of salt water and fresh water?

A. coral reef B. pelagic C. estuaries D. Abyssal

72. Which one of the following is characterizes climax community best?

A. Showing insignificant change in biodiversity.

B. Species diversity increase alarmingly.

C. Pioneer communities never exist at the stage.

D. It is evidenced at an overnight change.

73. The right sequence of phases in an ideal population growth curve is shown by

A. Log➔lag➔decline➔ stationary C. Lag➔log➔decline➔ stationary

B. Log➔lag➔ stationary➔decline D. Lag➔ log➔stationary➔decline

74. Which of the following sequences of forest types is correct in the decreasing order of their biodiversity?

A. Deciduous- coniferous- tropical C. tropical- Deciduous- coniferous

B. coniferous- tropical- Deciduous D. coniferous- Deciduous- tropical

75. The biome characterized by permafrost (frozen soil) and nearly almost treeless terrestrial biome is:

A. Desert B. Taiga. C. Tundra. D. Thorn forest.

76. As succession in ecosystems goes on:

A. Biodiversity declines C. Biomass declines

B. Nutrient recycle increases D. Soil depth decreases.

77. Choose the one, which is **not** a typical characteristic of a rain forest?

A. Many leaf eating insects and monkeys may be found

B. controls the rate of runoff by holding water like a huge sponge

C. maintains a more or less steady temperature inside the forest

D. large herbivores and carnivores are plentiful

78. Which one of the followings can cause the biggest impact on the environment?

A. Migration of mammals and birds C. Human intervention

B. Predation D. Competition

USE THE INFORMATIONS FROM THE GIVEN TABLE TO ANSWER QUESTIONS FROM 79-81.

Species	Number of organisms in an species		
	Area 1	Area 2	Area 3
P.filcatus	44	4	56
J.procera	50	10	67
Acacia	41	0	0
C.lustanic	40	79	105
Equliptes tree	47	322	12

79. Which of the above area is the most diversified?

A. Area 1 B. Area 2 C. Area 3 D. All are equally diversified

80. Which one is odd species?

A. Acacia B. J.procera C. C.lustanic D. P.filcatus

81. The diversity index of area 2 is -------

A. 0.06 B. 1.56 C. 4.15 D. 1.71

82. A demographic transition occurs when the;

A. birth rate exceeds the death rate C .birth rate and death rate is similar

B. birth rate and death rate falls D. birth rate and death rate increases

83. Which of the following statement is not true about population growth?

A. if immigration exceeds emigration, population increase

B. if emigration exceeds immigration population decrease

C. if immigration exceeds emigration population decrease

D. if emigration and immigration are equal population remain the same

84. The process by which energy from the main source enters to the ecosystem is;

A. assimilation B. transpiration C. respiration D. photosynthesis

85. The nutrient which does not involve atmosphere as it moves within the ecosystem is;-

A. nitrogen B. phosphorus C. carbon D. sulphur

86. Which one of the following is showing exponential growth of population?

A. 10, 20, 40, 80… C. 10, 25, 45, 25, 50, 65…

B. 10, 15, 20, 25, 30…. D. 10, 20, 20, 30, 30 …..

87. Which vertebrate animals are proportional endemic to Ethiopia?

A. Birds B. Amphibians C. Reptiles D. Fishes

88. If one crosses phenotypically tall pea plants and all the off spring are tall, the parents

A. Both could be homozygous C. Both could heterozygous

B. Both could only be homozygous D. Both could only be heterozygous

89. Suppose a double stranded DNA molecule consisting of 1000 nucleotide bases Contains,if Adenine accouts 100, the number of the rest of bases would be:

A. 100 guanine, 400 cytosine, 400 thymine.

B. 400 guanine, 100 cytosine, 400 Thymine

C. 450Guanine, 450 Cytosine, 100 Thymine.

D. 400 Guanine, 400 Cytosine, 100 Thymine.

90. The appearance of an individual with respect to a given inherited characteristic is known as

A. Genotype B. Phenotype C. Homozygous D. Heterozygous

91. In heredity we studied the transmission of heritable factors from parents to offspring. Hence the only physical links between the generations (parents and offspring) are

A. character. B. traits. C.sex cells. D.cells.

92. If you have a chicken of the genotype Aa rr the possible gametes that it can produce are:

A. Ar, ar, aa and AA B. Ar, Ar, ar, ar C. AA, aa and rr,rr D. Aa, Aa, rr, and rr

93. In human albinism is determined by a recessive gene. If two parents produced a legitimate child who is an albino, the child has most likely inherited the defect from

A. Both parents C. The father only

B. The mother only D. Neither the mother nor the father

94. The human blue eye color is due to a recessive gene (b) and brown eye color is due to dominant gene (B). If the mother is BB and the father is Bb, what proportion of their children would be expected to be blue eyed?

A. None of the children C. one – fourth of the children

B. Three – fourth of the children D. Half of the children

95. Given white dwarf rat (female) is mated with a black giant rat (male), assuming that both rats are homozygous for the trait and the alleles for the black and giant dominant over the alleles of the respective traits of the dwarf rat, the cross would look like,

A. BbGg × BbGg B.BBGG×bbgg C. BBGG× BbGg D. BbGg × bbgg

96. The genotype of a "test cross" must be:

A. homozygous dominant for a trait. C. heterozygous recessive for different traits.

B. dominant for a trait. D. homozygous recessive for a trait.

97.Inter specific competition differs from Intra specific competition in that inter specific competition,

A. allow better advantage for the survival of population of the different species

B. allow better advantage for the survival of population of same species

C. allow extinction of one of the competitive species

D. always allow co-existence of different species

98. The chromosomes in eukaryotic cells usually come in pairs:

A. alleles B. genotype C. homologous chromosome D. homozygous chromosome

99. In ABO human blood group

A. Allele I^A dominant over allele I^B

B. The blood types are inherited through multiple alleles represented by a single locus.

C. Allele I^A and allele I^B are co-dominant to allele I^O

D. allele I^O dominant over allele I^B

100. Suppose genotype BB produces blue; Bb produces pink and bb produces white flowers.

Which of the following crosses is expected to produce all the three types of flowers?

A. Bbxbb B. BbxBb .C BBxbb D. bbxbb