Biology model examination for grade 12 in the year 2007 E.C

DIRECTIONS:-THIS PAPER CONTAINS BIOLOGY EXAMINATION FOR GRADE 12. THE EXAMINATION CONTAINS 100 ITEMS AND THERE IS ONLY ONE BEST ANSWER FOR EACH ITEM. CHOOSE THE BEST ANSWER FROM THE SUGGESTED OPTIONS AND WRITE THE LETTER OF YOUR CHOICE ON THE ANSWER SHEET.

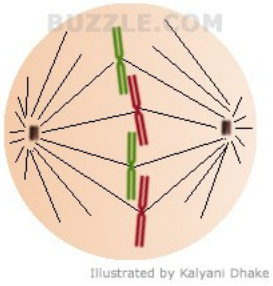
1. Unlike gram negative bacteria gram positive bacteria
   A. Have thick peptidoglycan
   B. stain pink in gram stain
   C. have endotoxin as structural component of cell wall
   D. have lipo polysaccharide outside the cell wall

2. In the process of gram stain ,chemicals used as primary stain & secondary stain are
   respectively
   A. Crystal Violet and grams iodine C. Safranin and grams iodine
   B. Crystal Violet and safranin D. Acetone and Crystal Violet

3. A type of selective breeding that involves breeding an organism with its close relatives is
   A. cross breeding C. Random mating
   B. Inbreeding D. Hybridization

4. The difference in gram stain in bacteria is due to the difference in structure of their
   A. Cell wall. C. capsule
   B. Cell membrane D. flagella

5. Which stage of cell division is represented by the following diagrar



   A. anphase of mitosis
   B. Metaphase of mitosis &meiosis II
   C. Metaphase of mitosis & meiosis I
   D. Anaphase of meiosis II

6. Synapsis and crossing over between homologous chromosomes occurs during

A. Metaphase of meiosis I. C. prophase of meiosis I
B. Prophase of meiosis II D. anaphase of mitosis

7. Non-photosynthetic eukaryotic organisms having cell wall belong to kingdom…….
A. Protista C. monera
B. fungi D. Animalia

8.The structural components that are found only in some bacteria are
A. Cell wall made up of peptidoglycane C.Ribosome & DNA
B. Cytoplasm D.Capsule & flagella

9.The first true experiment that has disproved the theory of spontanous generation for
large 0rganisms was performed by
A. Louis Pasteur C. Robert koch
B. Franncesco Redi D. Joseph Lister

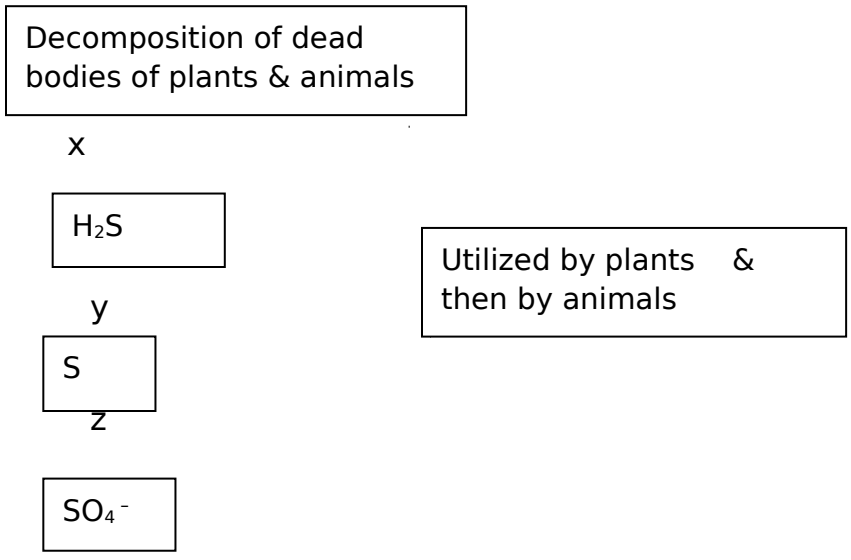
10. Among the following one is not the correct idea of Robert koch postulate.
A. The micro organisms must always be present when the disease is present
B. The micro organism can be isolated from an infected individual & then grow in culture.
C. Introducing such cultured micro organisms in to a healthy host should results in disease developing.
D. It is not possible to re-isolate the microorganism to obtain a pure culture.

11. Degenerative diseases are
A. types of infectious diseases.
B. Caused as aresult of person’s working condition
C. Caused as a result of ageing
D. Caused by lack of nutrients in our diet.

12. Among the following nutrient cycles, which one do not require the action of bacteria? A. Carbon cycle C. Sulphur sycle
B.Water cycle D. nitrogen cycle

13. Which groups of bacteria oxidizes the conversion of nitrite to nitrate?
    A. Nitrosomonas C. Pseudomonas
    B. Nitrobacter D. Clostridium
14. People with AIDS are easly affected by opportunistic infections ,because the viruse that cuse AIDS
    A. Produce antibody against infections in their body
    B. Stimulates the growth infectious agents in their body
    C. Weakens the their immune systems.
    D. All of the above
15. In nitrogen cycle nitrogen gas is returned to the atmosphere by
    A. ammonifying bacteria C. de-nitrifying bacteria
    B. nitrifying bacteria D. nitrogen fixing bacteria

Answer Question number 16 based on the following diagram.



16. What types of bacteria are represented by letters x ,y & y respectively?
    A. Desulphovibro ,photosynthetic sulphur baceria & non photosynthetic sulphur bacteria.

B. Desulphovibro , non photosynthetic sulphur bacteria & photosynthetic bacteria.

C. Photosynthetic bactria , non photosynthetic bacteria & desulphovibro.

D. Photosynthetic bacteria , chemosynthetic bacteria & non photosynthetic bacteria.

17. The enzyme reverse transcriptase catalizes the convertion of

A. DNA to RNA
B. RNA to DNA
C. DNA to an other DNA
D.DNA to nucleotides

18. The structure that is found in all viruses is

A. a protein shell of capsid
B.RNA or DNA as genetic material
C. a membrane made from lipids & protein outside the capsid.
D. A & B only

19. Biologists use Agrobacterium tumefacien to transfer genes that have been inserted to it in to

A . bacteria B. viruses C. some plants D. some animals

20.The bacteria that are used in production of vinegar are

A. azato bacter B. Aceto bacter C. lacto bacillus D. lactococcus

21. Among the following, one occurs when two different species compete for the same resource in the same habitat.

A. predation
B.commensalism
C. interspecific competition
D. intraspecific competiton

22. The receptor that is found on the surface of T-helper cell on which HIV binds is?

A. gp120 B. gp141 C. CD4 D.none of the above.

23. In ecological succession , which term describes the organisms that primarly inhabit the bare land?

A. seral species
B. pioneer species
C. climax communities
D. hydrosere

24. A geographycal area with specific climate ,soil type ,flora & fauna addapted to the abiotic condition in the area is

A. Biospher B. Habitat C.biome D. ecosystem

25. A unique type of aquatic biome where mixing of salt water & fresh water occurs is

A . Estuarine C. coral reef

C. ocean abyssal zone D. ocean pelagic

26. Among the following the one that do not contribute to increase in biodiversity is

A. Formation of new ecosystem

B. Creation of new species

C. Formation of new genetic variation

D. Extniction of species & lose of ecosystem complexity.

27. A number indicating the ecosystems biodiversity is called

A. species diversity C. index of diversity

B. ecological diversity D. Habitat diversity

28. Both floating plants & tadpoles live in open water habitat. Plants use sunlight ,co_2 & minerals while frogs feed on larva of insects. this means that

A .they have the same ecological niche

B. There is intra specific competition between them

C. They have different ecological niche in the same habitat

D. There is interspecific competition between them

29. Which one of the following is not true about **lock & key** model & **induced fit** model?

A. Both models suggest that ,enzymes catalyze chemical reactions by lowering activation energy

B. Both models propose that the shapes of the substrate molecules are complementary to that of the active site.

C. In induced fit model the binding of the substrate molecule produces a conformational change (change in shape) in the active site

D. Induced-fit model is prefered by most biologists over the lock & key model as it explains other properties of enzymes in a more complete manner.

30. Which one of the following does not describe the organism in to which the new gene is introduced?

A. Transgenic organisms C. genetically engineered organisms

B. genetically modified organisms D. cloned organisms

31. Desiered new genens can be transfered in to cereals such as maize,tobacco,apple & carrots using

A. Bacteriophages B. gene gun C. agrobacterium tumefaciens D. viruse

32. The life activity viruses can perform independently is ?

A. respiration B.Active transport C. facilitated diffusion D. none of the above.

33. Among the following which one can not be taken as criteria to differentiate DNA from RNA?

A. stability of the molecules C.comositon of organic base & sugar type

B. reactivity with other molecules D. none of the above

34. What process are R ,S & T representing respectively ?

DNA $\xrightarrow{R}$ DNA $\xrightarrow{S}$ RNA $\xrightarrow{T}$ Protein

A. transcription-translation &revers transcription

B. translation, replication & transcription

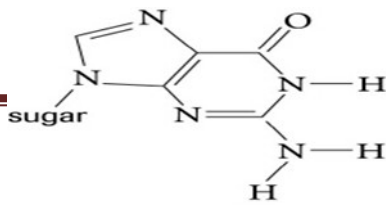
C. Replication ,transcription & translation

D. replication,translation & transcription

35. The period when the body keeps replacing the T-cells as fast as they are destroyed by HIV is called

A. latency period B. incubation period C. window period D. B & C

36. Which component of the organisms body do not contribute to the release of phosphorus in to the soil through decomposition?
    A. DNA & RNA B.cell membraine C. ATP D. Protein
37. In the process of DNA strand formation by condensation,
    A. The phosphate end on carbon-5 of one nucleotide forms a bond with the OH on C-3 end of the other nucleotide .
    B. The phosphate end on carbon-3 of one nucleotide forms a bond with the OH end on C-5 of the other nucleotide .
    C. The phosphate end on carbon-5 of one nucleotide forms a bond with the OH end on C-1 of the other nucleotide .
    D. The phosphate end on carbon-3 of one nucleotide forms a bond with the OH end on C-1of the other nucleotide .
38. If a heterozygus F_1-generation shows an intermidiate phenotype between two homozygus parents , the type of dominance exhibited is
    A. co-dominance C. complet dominance
    B. over dominance D. incomplet dominance.
39. Imagine that a codon in the template strand of a gene has the sequence TAC. What sequence of the anticodon would decode this codon?
    A. TAC B. UAC C. ATG D. AUG
40. During DNA replication, a mistake was made in which ‘A’ was changed to ‘G’. This kind of mutation is called
    A. neutral mutation C. insertion mutation
    B. deletion mutation D. point mutation
41. The type of RNA molecule that is created in the nucleus and then carries the genetic information to the cytoplasm.
    A. mRNA B. tRNA C. rRNA D.RNA poymerase
42. Which one of the following is not required for protein synthesis once transcription is occured? A. mRNA B. tRNA C. rRNA



43. The molecule shown below is

A. nucleotide C. purine base

B. amino acid D. pyrimidine base

44. Which of the following is associated with only the lagging strand during DNA replication? A. RNA primers C. DNA polymerase III

B. DNA polymerase I D. Okazaki fragments

45. If the sequence in one strand of a short segment of DNA is 5'–CTGGAT–3', the complementary sequence in the opposite strand is

A. 3'–GACCTA–5' C. 3’-GACCUA-5’

B. 5'–GACCTA–3' D. 5’-GACCUG-3’

46. If the percent composition of adenine in a DNA molecule is 35%, what will be the percentage composition of guanine & thymine respectively?

A. 35% &15% B. 25% & 75% C. 15% & 35& D.depends on the species

47. In double strand of DNA

A. Adenine pairs with thymine forming two ionic bonds.

B. Guanine pairs with cytosine forming three hydrogen bonds.

C. Adenine pairs with cytosine forming two covalent bonds.

D. Cytosine pairs with guanine forming phosphodiester bond.

48. In Mendel's F2 generation, **one out of four plants** had white flowers because

A) one parent was homozygous dominant

B) both parents were heterozygous purple

C) one parent was homozygous recessive

D) both parents were heterozygous white

49. The appearance of an individual resulting from a given gene combination is refered to as the

A)genotype B) phenotype C) karyotype D) alleleotype

50. Anticodon is the term applied to

A. the part of the tRNA that interacts with the codon on mRNA

B. the list of amino acids that corresponds to the genetic code

C. the several three-nucleotide that code for "stop"

D. the part of the mRNA that carry information for specific protein

51. If a test cross produces progeny that are **round yellow,round green, wrinkled yellow & wrinkled green** in the ratio 1:1:1:1, what is the genotype of the parent plant?

A.YYRR B. RrYy C. RRYy D.RrYY

52. An organism having Tt genotype can produce gamete with allele T & another gamete with allele t based on Mendel's law of……

A . segregation B. Independent assortment C. dominance D. co-dominance.

53. Which one of the following represents a back cross?

A. TT X tt B. tt X tt C. Tt X Tt C. Tt x TT or Ttxtt

54. As helicase unwinds the DNA molecule, the separated strands are kept apart by

A. Single strand binding proteins C. DNA polymerase III

B. DNA polymerase I D. RNA primase

55. Select the incorrect statement about analogus structures

A. they are structures that are morphologically & developmentally different , but perform the same function.

B. they do not indicate two species share the same ancestor.

C. fore limbs of human,cats & bats are examples of analogus structures. D. A & B

56. suppose the Archiologist dicovered remains of plant material which contains ¼ of the original content of radioactive C-14.how old is the fossil of plant material if the half life time of C-14 is 5700 years ?

A. 22800 years B. 17100 years C. 11400 years D. 11700 years.

57. By the statement 'survival of the fittest', Darwin meant that _____.

A. The strongest of all species survives

B.The most intelligent of the species survives

C. The cleverest of the species survives

D. The most adapted species to changes survives

58. Allopatric speciation occurs when

A. species become physically isolated by Geographycal barriers

B. species live together and breed freely to produce viable offspring

C. they are isolated but often come together for breeding

D. species live in the same area ,but prevented from breeding behaviorally

59. Without having to learn, the spider spins a perfect web the first time of its try & every other time afterwards. This type of innate behvior is

A. Imprinting C. reflex action

B. orientational D. instnictive behavior

60. After repeated observation of her mother baking injera, a girl managed to do the same perfectly in her first try.this type of learned behavior is

A. insight learning C. conditioned stimulus

B. Latent learning D. inistnictive behavor.

61. The biologist that studies about how life began on the earth is

A. astrobiologist C. micro biologist

B. Paleobiologist D. macrobiologist

62. Which one of the following is wrong?

A. Experimental science is the use of experiment to obtain information.

B. Applied science is the use of scientific research to meet certain human needs

C. Science is a unique system of acquiring knowledge based on the scientific method. D. none of the above

63. Which one of the following ideas is against the theory of spontaneous generation?

A. -mice emerge from containers containing dirt shirt & cereal

B. - muddy soil give rise to frogs

C. - rotten meat give rise to fly.

D. only flies could produce more flies

64. In scientific experiment, for our experiment to be **fair test,**

A. All the controlled variebles should be kept constant

B. All the independent variables should be kept constant.

C .All the confounding variebles should be kept constant

D. all of the above

65. The mosquito larva hang from the surface of water by their breathing tubes. This is because of which property of water?

A. Water has high surface tension

B. water has high specific heat capacity

C . water has high latent heat of vaporization

D.water is transparent.

66. If a mother, heterozygous for hemophilia marries a normal male, what proportion of her daughters & sons will be hemophilic respectively?

A. 0, 1/2 B. 1/2, 1/2 C. 1/2, O D. 1/4, 3/4

67. Which one of the following laboratory equipment is used to separate solid from liquid without filteration?

A. petridish B. Data loger C. Centrifuger D. scalpels

68. Which one of the following is **not true** about phospholipids?

A. They are formed from a glycerol ,two fatty acids & a phosphate group.

B. They are one of the basic components of cell membrane

C .The phosphate end is ionic & hydrophilic while the hydrocarbon tail is covalently bonded & hydrophobic.

D .In water the hydrophilic end face inward away from water & the hydrophobic heads face outward into the water & to form a bi layer.

69. If your quadrat measures 1mx 1m & you have an area of the land $20m^2$ & species A occurs on average 4 times per a quadrat, how many individuals of

species A are in the location? A. 40 B.80 C. 400 D. 80

70. Which one of the following is **not true** about why starch became a preferable form of storage carbohydrate in plants?

A. Because of the branched nature of its component, it can not be easily hydrolysed.

B. It is insoluble in water & can not affect the water balance of a cell

C. It is a compact molecule & many α-glucose molecules can be stored in small space

D. Since it is insoluble in water, the molecules can not move out of the cell, that means it remain in the storage organs.

71. If we want to measure the CO_2 intake by the plant as the light intensity increases over the day,which one of the following will be a confounding or confusing variable? A. light B. temperature C. CO_2 D. Water

72. Enzymes speed up biochemical reactions by

A. decreasing the kinetic energy C .increasing the activation energy

B. increasing the kinetic energy D.lowering the activation energy

73. Environmental benefit of using enzymes in industries include

A. redusing CO_2 emission & then global warming

B. increase the purity of the product

C. reduce packaging materials D. All

74. Polysaccharides, nucleic acids and proteins are all polymers synthesized from their monomers by

A. connecting monosaccharides with removal of water

B. the addition of water to each pair of monomers

C. the removal of water from each pair of monomers

D. ionic bonding of the monomers

75. Which one of the following is not true about the hydrogen bond that joins two water molecules together?
   A. It keeps breaking & reforming as the molecule moves around.
   B. It is formed between hydrogen atom of one water molecule & oxygen atom of other water molecule
   C. It is formed between oxygen atom of one water molecule & the oxygen atom of the other water molecule.
   D. It is a weak bond & always exists between the water molecules in a mass of water.
76. If an inhibitor binds to the active site of an enzyme before substrate binds to it, it is called _____ inhibitor.
   A. competitive B. allostric C. noncompetitive D. irreversible
77. Which microscope allows researchers to view the structure of cells in great detail?
   A. transmission electron microscope C.compound light microscope
   B. Scanning electron microscope D.simple light microscope.
78. Organic molecules are molecules that always contain
   A. Carbon & Hydrogen. B. Carbon & Oxygen C.Hydrogen & Oxygen D.Carbon
79. Which property of water is very important for temperature control in terrestrial mammals ?
   A. Water has high latent heat of vaporization.
   B. water is a good solvent
   C. Water has solid form with lesser density than it's liquid form.
   D. Water is transparent
80. Among the following polysaccharides one is not a polymer of α-glucose ?
   A. starch B. glycogen C. cellulose D. None
81. Which one of the following factors can affect the activity of the enzyme without affecting the shape of the active site of the enzyme?

A. temperature B. PH C. competitive inhibitor D. non-competitive inhibitor

82. Which stage of aerobic respiration produces ATP , NADH , FADH2, ATP and releases CO2?

A.glycolysis B.Krebs cycle C.electron transport chain D.fermentation

83. Among the following , one occurs in both photosynthesis and respiration?

A. glycolysis B. chemiosmosis C. krebs cycle D. calvin cycle

84. Select the incorrect statement about glycolysis.

A. glycolysis occurs in the mitochondria

B. glycolysis is the first step in both aerobic and anaerobic respiration

C. it ends up with production of 2 ATP(net), 2 NADH, and 2 pyruvate

D. it can occur independent of the presence of oxygen.

85. Muscle Cramps during exercise are caused as aresult of ..... occuring in our body.

A. glycolysis B. alcohol fermentation C. lactic acid fermentation D.kreb's cycle

86. Light dependent reaction produces all except

A. Oxygen B.NADPH C.Sugar D.ATP

87. Which of the following is the main difference between cyclic and noncyclic photophosphorylation?

A. they use different electron acceptors

B. noncyclic photophosphorylation occurs in the stroma

C. Only photosystem I is used during the cyclic process

D. noncyclic photophosphorylation does not produce ATP

88. Simple diffusion across a plasma membrane can not be affected by

A. concentration gradient C. surface area of the membrane

B. thikness of the membrane D. the number of carier proteins present.

89. Hypertonic solution is a solution having

A. higher water potential than its enironment

B. higher solute concentation than its environment

C. the same water potential with its surounding

D. none of the above

90. Which of the following does not apply to chloroplasts?

A. They are bounded by two membranes, the inner of which is folded into the cristae

B.They contain an internal membrane system consisting of thylakoids.

C.They can synthesize ATP from ADP and Pi (inorganic phosphate).

D. They contain chlorophyll and the enzymes required for photosynthesis.

91. Among the following one is not an active process.

A. Facilitated diffusion C. pinocytosis

B.phagocytosis D. receptor mediated phagocytosis

92. Alpha helix & beta pleated structures are two different forms of

A. primary structure of protein C. tertiary structure of protein

B. secondary structure of protein D. quaternary structure of protein

93. In a series of chemical reactions occuring in our body,if the enzyme catalyzing the formation of end product inhibites the action of the first enzyme in the series ,this type of inhibiton is known as

A. competitive inhibition C. Feedback controle mechanism

B. end product inhibition D. B&C

94. Among the following scientists, select the one who has no Contribution in the development of cell theory.

A .Rene Dutrochet C. Matthias Schleiden & Theodor Schwan

B. Rudolf Virchow D. Anton van Leeuwenhoek

95. Which of the following organisms are thought to be the oldest organisms on the earth ?

A. Eubacteria B. Eukariya C. Archae bacteria D. protozoans

96. The calvin cycle requires each of the following inputs **except**:

A.CO2 B.O_2 C.ATP D.NADPH

97. Cells can produce some amount of ATP without using ATP-synthase by
    A.Oxidative phosphorylation C. chemiosmosis
    B. substratelevel phosphorylation D. Electron transport chain.
98. In which step of aerobic respiration reduced NAD & $FADH_2$ lose their hydrogens & become oxidized?
    A. kreb's cycle B. Glycolysis C. electron transport chain D. link reaction
99. Whch one of the following compounds contain more energy than all the rest per a molecule ?
    A.Pyruvic acid B. ATP C. NADH D. $FADH_2$
100. Which one of the following is true about photorespiration ?
    A. It is a problem of C_3 plants in tropics
    B. It involves reaction of ribulos biphosphate with oxygen instead of CO_2.
    C. It occurs as a result of CO_2 shortage in light independent reaction.
    D. All of the above