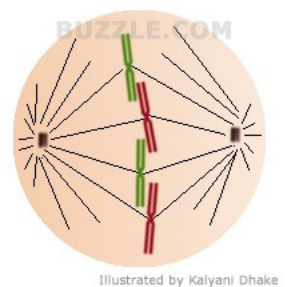


Biology model examination for grade 12 in the year 2007 E.C

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
 - B. Crystal Violet and safranin
 - C. Safranin and grams iodine
 - D. Acetone and Crystal Violet
3. A type of selective breeding that involves breeding an organism with its close relatives is
 - A. cross breeding
 - B. Inbreeding
 - C. Random mating
 - D. Hybridization
4. The difference in gram stain in bacteria is due to the difference in structure of their
 - A. Cell wall.
 - B. Cell membrane
 - C. capsule
 - D. flagella
5. Which stage of cell division is represented by the following diagram
 - 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

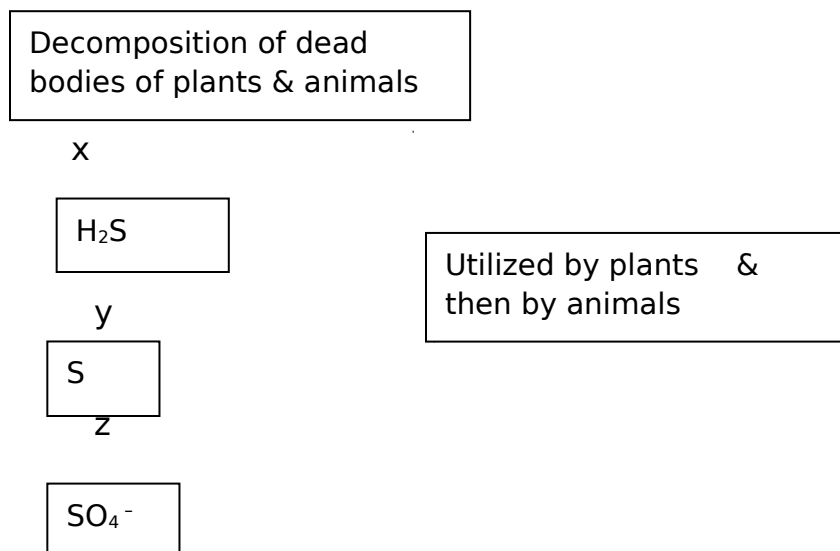


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- A. Metaphase of meiosis I.
 - B. Prophase of meiosis II
 - C. prophase of meiosis I
 - D. anaphase of mitosis
7. Non-photosynthetic eukaryotic organisms having cell wall belong to kingdom.....
 - A. Protista
 - B. fungi
 - C. monera
 - D. Animalia
8. The structural components that are found only in some bacteria are
 - A. Cell wall made up of peptidoglycane
 - B. Cytoplasm
 - C. Ribosome & DNA
 - D. Capsule & flagella
9. The first true experiment that has disproved the theory of spontaneous generation for large organisms was performed by
 - A. Louis Pasteur
 - B. Francesco Redi
 - C. Robert Koch
 - D. Joseph Lister
10. Among the following one is not the correct idea of Robert Koch's postulate.
 - A. The microorganisms must always be present when the disease is present
 - B. The microorganism can be isolated from an infected individual & then grow in culture.
 - C. Introducing such cultured microorganisms into a healthy host should result 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 a result 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
 - B. Water cycle
 - C. Sulphur 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 easily 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.

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24. A geographical area with specific climate, soil type, flora & fauna adapted to the abiotic condition in the area is
- A. Biosphere 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 does not contribute to increase in biodiversity is
- A. Formation of new ecosystem
B. Creation of new species
C. Formation of new genetic variation
D. Extinction of species & loss of ecosystem complexity.
27. A number indicating the ecosystem's 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 larvae 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 niches 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 preferred 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. Desired new genes can be transferred in to cereals such as maize, tobacco, apple & carrots using
- A. Bacteriophages B. gene gun C. agrobacterium tumefaciens D. virus
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. composition 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 & reverse 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

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 referred to as the
A) genotype B) phenotype C) karyotype D) allelotype
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 analogous 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 analogous structures. D. A & B
56. suppose the Archiologist dicovered remains of plant material which contains $\frac{1}{4}$ 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 Geographical 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 behavior is
- A. Imprinting
 - C. reflex action
 - B. orientational
 - D. instinctive 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. instinctive behavior.
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 variables should be kept constant
B. All the independent variables should be kept constant.
C. All the confounding variables 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, 0 D. 1/4, 3/4
67. Which one of the following laboratory equipment is used to separate solid from liquid without filtration?
A. petridish B. Data logger 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 1m x 1m & you have an area of the land 20m² & 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. reducing 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 a result of occurring 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. thickness of the membrane D. the number of carrier proteins present.
89. Hypertonic solution is a solution having
- A. higher water potential than its environment
- B. higher solute concentration than its environment

- C. the same water potential with its surrounding
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
B. phagocytosis
C. pinocytosis
D. receptor mediated phagocytosis
92. Alpha helix & beta pleated structures are two different forms of
A. primary structure of protein
B. secondary structure of protein
C. tertiary structure of protein
D. quaternary structure of protein
93. In a series of chemical reactions occurring in our body, if the enzyme catalyzing the formation of end product inhibits the action of the first enzyme in the series, this type of inhibition is known as
A. competitive inhibition
B. end product inhibition
C. Feedback control mechanism
D. B&C
94. Among the following scientists, select the one who has no contribution in the development of cell theory.
A. Rene Dutrochet
B. Rudolf Virchow
C. Matthias Schleiden & Theodor Schwann
D. Anton van Leeuwenhoek
95. Which of the following organisms are thought to be the oldest organisms on the earth?
A. Eubacteria
B. Eukarya
C. Archae bacteria
D. protozoans
96. The calvin cycle requires each of the following inputs **except**:
A. CO₂
B. O₂
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 & FADH₂ lose their hydrogens & become oxidized?
A. kreb's cycle B. Glycolysis C. electron transport chain D. link reaction
99. Which one of the following compounds contain more energy than all the rest per a molecule ?
A. Pyruvic acid B. ATP C. NADH D. FADH₂
100. Which one of the following is true about photorespiration ?
A. It is a problem of C₃ plants in tropics
B. It involves reaction of ribulos biphosphate with oxygen instead of CO₂.
C. It occurs as a result of CO₂ shortage in light independent reaction.
D. All of the above