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EDUCATIONAL ASSESSMENT AND EXAMINATIONS SERVICE (EAES)
ETHIOPIAN SECONDARY SCHOOL LEAVING CERTIFICATE
EXAMINATION (ESSLCE)
HAMLIE, 2015 E.C JULY 2023 G.C

SUBJECT CODE_ 06

BOOKLET CODE_480
TIME ALLOWED: 2 HOURS

GENERAL DIRECTIONS

THIS BOOKLET CONTAINS *BIOLOGY* EXAMINATION. THE CODE FOR THIS SUBJECT IS *06* AND THE CODE FOR THIS PARTICULAR BOOKLET IS *480*. PLEASE COPY THESE CODES ON YOUR ANSWER SHEET WHERE IT *READS SUBJECT CODE AND BOOKLET CODE*.

IN THIS EXAMINATION, THERE ARE A TOTAL OF *100 MULTIPLE CHOICE QUESTIONS*. CAREFULLY SELECT THE BEST ANSWER AND *BLACKEN* ONLY THE LETTER OF YOUR CHOICE ON THE SEPARATE ANSWER SHEET PROVIDED. FOLLOW THE INSTRUCTIONS ON THE ANSWER SHEET AND THE EXAMINATION PAPER CAREFULLY. USE ONLY *PENCIL* TO MARK YOUR ANSWERS. YOUR ANSWER MARK SHOULD BE *HEAVY* AND *DARK*, COVERING THE ANSWER SPACE COMPLETELY. PLEASE ERASE ALL UNNECESSARY MARKS COMPLETELY INCLUDING ANSWERS YOU HAVE CHANGED FROM YOUR ANSWER SHEET.

Mohammed Amar 3/8/2015

YOU ARE ALLOWED TO WORK ON THE EXAM FOR *2 HOURS*. WHEN TIME IS CALLED, YOU MUST IMMEDIATELY STOP WORKING, PUT YOUR PENCIL DOWN, AND WAIT FOR FUTURE INSTRUCTIONS.

ANY FORM OF CHEATING OR AN ATTEMPT TO CHEAT IN THE EXAMINATION WILL RESULT IN AN AUTOMATIC DISMISSAL FROM THE EXAMINATION HALL AND CANCELLATION OF YOUR SCORE(S).

PLEASE MAKE SURE THAT YOU HAVE WRITTEN ALL THE REQUIRED INFORMATION ON THE ANSWER SHEET BEFORE YOU START TO WORK ON THE EXAMINATION.

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1. Which one of the following sentences is correct about the activities of the heart?
   A. The noise of heartbeat one hears through a stethoscope is the sound of valves.
   B. As the heart beats blood travels through the arteries with a uniform pressure.
   C. Diastole is when the heart muscles contract and force the blood out.
   D. Systole is when the heart muscles relax and it fills with blood.

2. During culturing micro-organisms, all of the following activities are important **EXCEPT**
   A. tilting the lid of the Petri dish during inoculation.
   B. adding distilled water to a sterilized agar.
   C. sterilizing the inoculating loops.
   D. transferring target micro-organisms into an agar medium.

3. Which one of the following diseases can be caused by more than one type of microorganisms?
   A. Cholera
   B. Gastroenteritis
   C. Typhoid
   D. Tuberculosis

4. Which one of the following diseases is correctly explained with its causes or symptoms?
   A. Syphilis is caused by *Neisseria gonorrhoeae*.
   B. Gonorrhoea has a burning sensation symptom while urinating.
   C. Gonorrhoea is caused by *Treponema pallidum*.
   D. Syphilis has sore ulceration on the genitals as a symptom.

5. The names of which two taxa are used in binomial nomenclature?
   A. The two lowest units of classification
   B. The two middle units of classification
   C. The highest and the lowest unit of classification
   D. The two highest units of classification

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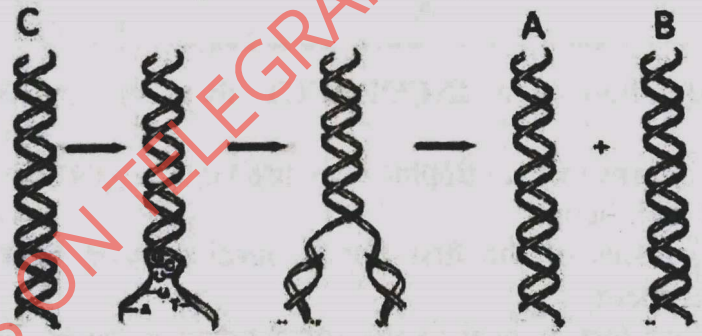
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6. In a dihybrid self-crossing of a plant with genotype DdCc, 3600 offspring were produced. How many of the offspring will have the ddcc genotype?
   A. 300
   B. 450
   C. 150
   D. 225

7. Identify the correct statement regarding translation in eukaryotic cells. The
   A. helicase enzyme begins to unwind a section of DNA.
   B. polymerase assembles free RNA nucleotides into a chain.
   C. first two codons of the mRNA enter the ribosome.
   D. RNA polymerase moves along the antisense strand.

8. Which of the following sentences explains how crossing over brings variation?
   A. In meiosis I, there is splitting up of pairs of homologous chromosomes and line up.
   B. In meiosis I, there is exchange of a section of DNA between chromatids.
   C. In meiosis II, homologous chromosomes align themselves independent of other pairs.
   D. In meiosis II, chromatids from each chromosome are separated at random.

9. Consider the following model of DNA replication.



Which one of the following is true about A, B and C?
   A. A and B are identical with each other but not with C.
   B. C is not identical with A and B.
   C. B and C are not identical with each other.
   D. A, B and C are identical with each other.

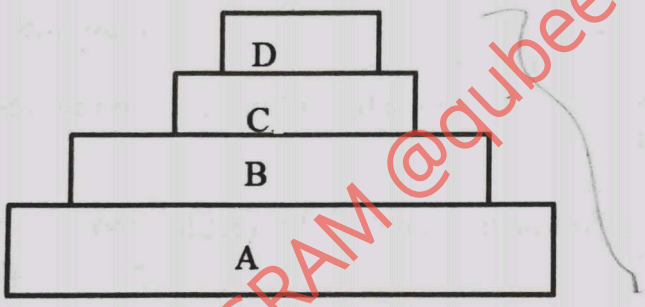
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10. What is the central role of tRNA in translation?
    A. Carrying genetic information from DNA in the nucleus to ribosomes
    B. Recognizing the codon of mRNA and bring the correct amino acid to the ribosomes
    C. Acting as a template for converting a genetic code into amino acid sequence
    D. Assembling the amino acid into a polypeptide chain

11. Which one of the following sentences explains the traditional use of biotechnology? Production of
    A. insulin using transgenic bacteria
    B. dairy products at household level
    C. myco-proteins under a laboratory
    D. vinegar using industrial fermenter

12. Consider the following diagram demonstrating the pyramid of energy.



Which of the following is **INCORRECT** about the above pyramid of energy?
    A. The organisms of each trophic level use large proportion of the energy to build their body.
    B. The organisms of the first trophic level convert light energy into chemical energy.
    C. The energy lost as heat to the surrounding in each trophic level is insignificant.
    D. The amount of energy transferred through the trophic levels drops with each step up of the pyramid.

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13. Which one of the following sentences is correct about mitosis? It
A. is the division of sex cells resulting in identical daughter cells.
B. produces four different daughter cells from a single cell.
C. is the division of somatic cells to make identical daughter cells.
D. produces half number of chromosomes from the original cell.

14. A cross between pea plants having heterozygous genotype (Rr) has been made. Which of the following is correct about the offspring according to the Mendelian inheritance? The genotypic probability of getting
A. Rr is 25%.
B. Rr is 75%.
C. RR is 50%.
D. rr is 25%.

15. Which one of the following is correct about DNA? It is
A. smaller molecule and coding for only protein.
B. made of phosphate, sugar and bases.
C. a single stranded molecule.
D. less stable and degrades quickly.

16. Which one of the following phyla is characterized by a flexible cartilaginous rod-like structure, that runs along the dorsal side of the body?
A. Phylum Mollusca
B. Phylum Chordata
C. Phylum Annelida
D. Phylum Arthropoda

17. Which one of the following groups of organisms is correctly matched with its phylum?
A. Starfish-Phylum Echinodermata
B. Fish- Phylum Arthropoda
C. Snail - Phylum Annelida
D. Earthworm - Phylum Mollusca

18. Which one of the following events happens during carbon cycle? Carbon dioxide is
A. transferred from plants to animals by their feeding relationship.
B. absorbed from air when microbes decompose plants and animals.
C. removed from the air by animals during respiration.
D. returned into the air by plants during photosynthesis.

19. Which one of the following is not the function of the liver?
A. Controlling cholesterol
B. Storing glycogen
C. Monosaccharide metabolism
D. Bile formation

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20. A zoologist studied 5 vertebrate species (spA, spB, spC, spD & spE) and described their features as follows.
spA: Smooth moist skin; pass parts of their lives in water and on land
spB: Streamlined bodies with scales; gills for gaseous exchange
spC: Feathers over the body and scales on legs; endothermic; horny beak
spD: Dry skin with scales; ectothermic; lungs for respiration
spE: Mammary glands; endothermic; higher internal body temperature
Based on the features listed above, spA, spB, spC, spD and spE can be classified under the vertebrate classes, respectively,
A. Amphibia, Reptilia, Aves, Mammalia, and Pisces.
B. Pisces, Aves, Reptilia, Mammalia, and Amphibia.
C. Pisces, Amphibia, Aves, Reptilia, and Mammalia.
D. Amphibia, Pisces, Aves, Reptilia, and Mammalia.

21. Which of the following plant adaptation mechanisms helps cactus to adapt in the desert environment?
A. Spreading its seeds in wider areas
B. Increasing number of stomata in its leaves
C. Having broad leaves
D. Storing water in its tissue

22. What is the function of dermis of the skin? It
A. acts as protection against heat loss.
B. protects the entry of pathogens into the body.
C. forms a waterproof around the body tissue.
D. contains blood vessels and sweat glands.

23. Children who play by spinning round and round fast, when they stop, they feel dizzy. Why?
A. The otoliths round in the same direction with the head.
B. The optic nerves reports that the children are still moving.
C. The fluid in their semicircular canals keeps on moving after they stop.
D. The sensory hairs vibrate highly in response to movement of their body.

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24. When does menstruation start in women with no obvious reproductive a health problem? It happens when
   A. the fertilized ovum reaches the uterus and attaches into the thick, spongy lining.
   B. the FSH stimulates the development of a follicle in the ovary and the egg ripens.
   C. pregnancy occurs and the embryo obtains nourishment and oxygen.
   D. thick spongy lining of the uterus detaches in the absence of pregnancy.

25. Which one of the following sentences is correctly matched with the function of kidney structures?
   A. Bowman's capsule - acts as a filter to produce urine
   B. Cortex - monitors the osmotic pressure of the blood
   C. Glomerulus - concentrates urine and conserves water
   D. Loop of Henle` - involved in ultrafiltration

26. Which of the following temperature controlling mechanisms in homoiotherms is categorized into behavioral method?
   A. Sweating when the temperature increases
   B. Constriction of capillaries when the temperature falls
   C. Shivering as a result of drop in temperature
   D. Seeking shade when the temperature rises

27. Industries in the medicine sector use glucose oxidase in clinistix strips for
   A. restoring blood supply to area of heart muscle.
   B. detecting toxic metabolites in the blood.
   C. easy diagnosis of diabetes by examining a urine sample.
   D. reducing the viscosity of mucus.

28. In the systematic naming of enzymes, assume an enzyme is designated as EC 3.4.11.1. Which of the following correctly describes this enzyme?
   A. 11 - gives a sub-subclass to which the enzyme belongs.
   B. 1 - a reference of Enzyme Commission.
   C. 4 - shows to which main class the enzyme belongs.
   D. 3 - indicates a subclass to which the enzyme belongs.

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29. Which one of the following sentences explains the lock-and-key model of enzyme action? The
A. attached substrate- the enzyme complex enters into a transition state.
B. model explains enzyme inhibition in a complete manner.
C. shapes of the substrate is complementary to the active site.
D. attachment of substrate to an enzyme produces a conformational change.

30. Which one of the following sentences is correct about apo-enzymes? They are
A. cofactors that give an enzyme its catalytic activity.
B. proteins that combine with cofactors to form active enzymes.
C. organic molecules and many are derived from vitamins.
D. inorganic molecules that bind loosely with the cofactors.

31. How does a competitive inhibitor affect an enzyme catalyzed reaction? By
A. denaturing the active site of the enzyme
B. producing conformational change of the enzyme
C. binding to the allosteric site of the enzyme
D. blocking the active site of the enzyme

32 Which one of the following leaf structures is correctly matched with its function?
A. Palisade mesophyll - the main photosynthetic tissue of the leaf
B. Waxy cuticle - controls the entry of carbon dioxide into the leaf
C. Guard cells - have lots of air space and gas exchange area of the leaf
D. Spongy mesophyll - helps to prevent water loss from the leaf

33. Which one of the following statements correctly describes the movement of materials in plants?
A. Passive transport can takes place in the phloem.
B. The transport of organic materials is due to transpiration.
C. Water is transported in dead tissue.
D. Active transport can take place in the xylem.

34. What will happen if an agriculture extension worker injects gibberellins into a dwarf plant? The
A. leaves will fall.
B. stem will grow.
C. roots will elongate.
D. side shoots will grow fast.

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35. A biologist collected two types of seeds (SA and SB) from the field and sowed them in moist soils enriched with nutrients. Then, he recorded his observations as follows:

SA

- The seedling of this seed emerged from the soil curved while pushing up through the soil.
- The hypocotyl straightened and carried the cotyledons and plumule above the soil surface.

SB

- The plumule of the seedling pushed its way out of the soil, while the cotyledon remained underground.
- Unlike what occurred during the germination of SA, the plumule of this seed did not form a hook.

Which one of the following is correct about the observations of the biologist?

A. Both SA and SB are of monocots.
B. SA is of a monocot, while SB is of a dicot.
C. Both SA and SB are of dicots.
D. SA is of a dicot, while SB is of a monocot.

36. Which one of the following sentences correctly describes the properties of water? It

A. contracts when it freezes and ice acts as an insulator.
B. takes low energy to change into vapor.
C. allows all light wavelengths to pass through its various depths.
D. requires high amount of energy to heat up.

37. An organic molecule which is an important part of structure of chromosome is

A. amino acid.
B. glycogen.
C. amylose.
D. triglyceride.

38. In animal cells, glycogen is hydrolyzed quickly to release glucose for respiration. This is due to the presence of several

A. microfibrils in its side chain.
B. α-1,6- glycosidic bonds.
C. β-1,4-glycosidic bonds.
D. enzymes that hydrolyse it easily.

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39. A student has conducted an experiment using different enzymes to assess the enhancement of reaction rates under different conditions. She represents her results as indicated in the following table.

Enzymes used	Cofactors used	Rate enhancement	Optimum temperature required °C
X	Zn^{++}	1.4×10^{17}	37
Y	Cu^{++}	7.7×10^{6}	45
Z	No cofactor	4.6×10^{5}	28
M	Co^{++}	1.7×10^{8}	30

Which one of the following is an acceptable conclusion of the experiment?

A. Enzyme 'X' could have enhanced the rate better at temperature slightly higher than 37°C.
B. Enzyme 'M' cannot enhance the rate of reaction further if the temperature exceeds 30°C.
C. The rate enhancement for enzymes 'Z' is less because it didn't use a cofactor.
D. As temperature increases the rate of chemical reaction decreases.

40. This item is based on the following diagram which depicts structural formula of a biological molecule.



The molecule represented by the above structure is

A. cellulose.
B. amylopectin.
C. fatty acid.
D. glycerol.

41. Which of the following is an Ethiopian endemic plant?

A. Noug seed
B. Avocado
C. Bahir zaf
D. Bunna

42. When a biologist shares her research findings with other fellow biologists, she is

A. making her hypothesis.
B. reporting her result.
C. drawing her conclusion.
D. analyzing her data.

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43. Walia ibex is an endemic animal species in Ethiopia which is found in
A. Nechisar National Park.
B. Omo National Park.
C. Bale Mountain National Park.
D. Simien Mountain National Park.

44. All of the following sentences are correct about pollution **EXCEPT**
A. deforestation increases the amount of CO_2 absorbed from the atmosphere.
B. decomposition of dead bodies increases the amount of CO_2 in the atmosphere.
C. burning fossil fuels increases pollution due to the release of hydrocarbons.
D. burning of wood increases pollution by causing global dimming which blocks sunlight.

45. This item is based on the table below which shows a list of molecules.

No	Molecules
1	Calcium carbonate, glucose and methane
2	Carbon dioxide, linoleic acid and water
3	Linoleic acid, glucose and methane
4	Iron III oxide, glycine and glucose

In the above table, which number holds only organic molecules?
A. 2
B. 3
C. 4
D. 1

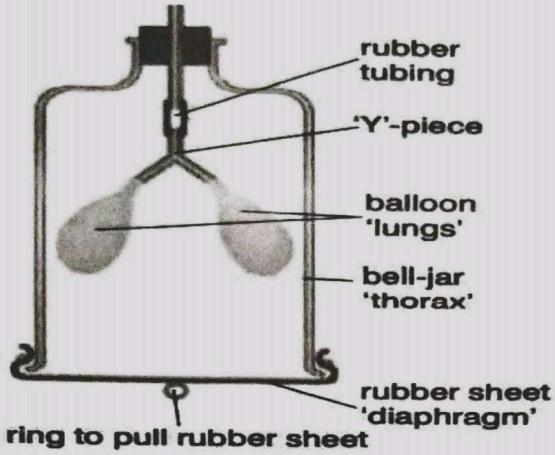
46. Which of the following enzymes is correctly matched to the food stuffs it acts on?
A. Pepsin - protein
B. Maltase - lipids
C. Amylase - fats
D. Trypsin - starch

47. Suppose your friend fails suddenly due to heart attack while he is playing football. The victim needs artificial breathing to keep him alive until medical support arrives. Which activity is strictly prohibited in this situation?
A. Remove any obstacle from the mouth that might block the airway
B. Open the airway by removing any obstacles from the mouth
C. Make sure the airway is open and the head is tilted back
D. Give mouth - to - mouth resuscitation if he is conscious

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48. Consider the following figure which demonstrates air movements during breathing using the bell-jar model representing the lung.



Which of the following breathing movements happens when air enters into and exits from the balloon lungs?

A. Air enters when the bell-jar thorax contracts.
B. Air enters when the rubber sheet is pushed up.
C. Air exits when Y-piece is rotated both clock wise and counter - clockwise.
D. Air exits when the balloon lungs have higher pressure than the external environment.

49. Which one of the following structures of the heart is correctly matched with its function?

A. Right atrium - contracts and forces deoxygenated blood into the lungs
B. Left ventricle - contracts and forces oxygenated blood around the body
C. Right ventricle - contracts and forces blood into the left ventricles
D. Left atrium - contracts and forces blood into the right ventricles

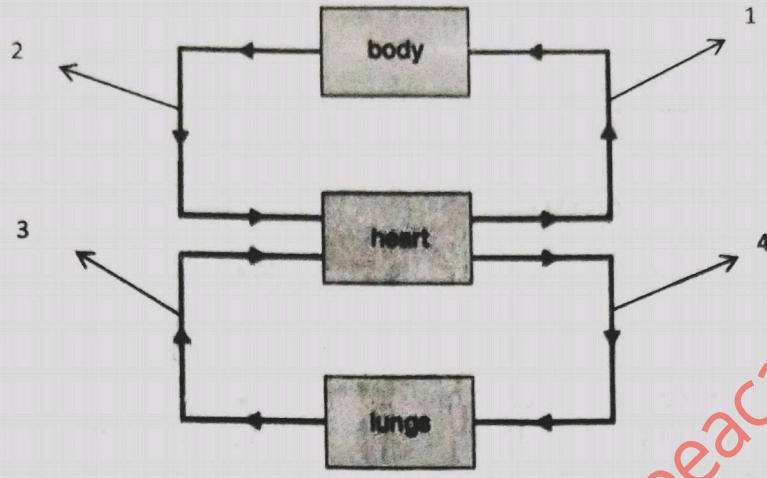
50. In the aerobic cellular respiration

A. Krebs cycle takes place in the cytoplasm.
B. glycolysis takes place in the mitochondria.
C. electron transport chain takes place in the cytoplasm.
D. pyruvate enters into the mitochondria for further stages.

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51. Consider the following diagram showing blood circulation system in the human body.



In the above diagram, the parts indicated by numbers 1, 2, 3 and 4, are respectively

A. aorta, vena cava, pulmonary vein, pulmonary artery.
B. pulmonary artery, pulmonary vein, vena cava, aorta.
C. pulmonary vein, aorta, vena cava, pulmonary artery.
D. vena cava, pulmonary artery, aorta, pulmonary vein.

52. Which one of the following descriptions of proteins is correctly matched with its function in a cell membrane?

A. Peripheral protein - anchor integral proteins to the cytoskeleton
B. Glycoprotein - reduces the fluidity of the membrane
C. Channel proteins - larger molecules can pass through them
D. Carrier proteins - specific ions can pass along them

53. Suppose a hypothetical cell of 15% solute concentration is put in a beaker containing 90% water and 10% solute. In which way will the water move?

A. From the cell to the beaker
B. From the beaker to the cell
C. Both into and out of the cell
D. Both into and out of the beaker

54. Which one of the following is an example of a learned behaviour?

A. Nest-building
B. Knee-jerk reflex
C. Weaving a web
D. Classical conditioning

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55 Which one of the following is correct about transport of substances across the cell membrane?

A. Simple diffusion - large particles transported through channel proteins
B. Facilitated diffusion - particles move from high water potential to lower one
C. Passive transport - particles require energy in the form of ATP to derive the transport
D. Active transport - particles move from low to higher concentration using carrier proteins

56. Which one of the following processes of aerobic respiration takes place in the Krebs cycle?

A. Hydrogen atoms carried by reduced NAD and FAD are released and split into protons and electrons.
B. Two molecules of ATP are used to phosphorylate each molecules of glucose.
C. Two carbon group from acetyl coenzyme A reacts with a 4-carbon compound to form citrate.
D. Fructose 1, 6-bisphosphate is split into two molecules of the three-carbon sugar GP.

57. In the course of evolution, which of the following is true about the human brain?

A. Modern humans have a brain size between 0.7% and 1.0% of their body mass.
B. *Australopithecus* have a brain size between 1.8% and 2.3% of their body mass.
C. The pre-humans brain uses 80% of the resting energy requirement.
D. *Homo sapiens* brain uses 25% of the resting energy requirement.

58 All of the following are examples of innate behaviours **EXCEPT**

A. training killer whales at marine parks.
B. increasing breathing rate during exercise.
C. producing tears when dust gets into the eyes.
D. a fly moving its maggot into more humid environment.

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59. Which one of the following is an example of in-sight learning?
   A. Salivation of a dog when a bell was rung in the absence of food, which was paired with the conditioned stimulus.
   B. Use of boxes, after several trials, by a chimpanzee placed in an enclosed area to obtain bananas placed on the top of an enclosure.
   C. Exhibition of modifications of natural behaviors of guide dogs, horses or zoo animals to desired behaviors.
   D. Lack of response from a lady, which sat in a shop in which a strong deodorant was continuously released from a can.

60. Which one of the following is an example of territorial behaviour of animals?
   A. A male robin threatening an intruder
   B. Fixed action of zebra fish to find a mate
   C. Penguins huddling to reduce heat loss
   D. Honeybees nesting in a tree

61. One of the following renowned Ethiopian biologists has developed a vaccine for the rinderpest disease.
   A. Professor Sebsebe Demissew
   B. Professor Yalemtsehay Mekonnen
   C. Professor Beyene Petros
   D. Professor Tilahun Yilma

62. A grade nine student has planned to study animal cells using a compound light microscope. She prepared a slide of stained human cheek cells for this purpose. Which one of the following activities should she first do?
   A. Adjust the iris diaphragm until the maximum brightness is coming.
   B. Set up the microscope with the lowest power objective in place.
   C. Using coarse focusing knob to rotate the nosepiece for a higher magnification lens.
   D. Looking through the eyepiece lens to move the objectives down.

63. Which one of the following is true about plant cells? They have
   A. vacuole which controls all activities of the cell.
   B. lysosomes which contain hydrolytic enzymes.
   C. chloroplast which is filled with sap, liquids and minerals.
   D. cell wall which gives support and strengthen to the cell.

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64. A plant cell is placed in a solution which has lower solute concentration than its contents. After a few minutes the cell will become
A. turgid.
B. flaccid.
C. plasmolysed.
D. burst.

65. Which one of the following is correct about human food digestion?
A. The stomach physically breaks down the ingested food.
B. Mouth use protease enzyme to breakdown proteins.
C. Large intestine is the site of lipid hydrolysis.
D. The small intestine is site of absorption of digested molecules.

66. Sickle cell anemia is caused by the replacement of glutamic acid by valine at a specific position in the beta chains of hemoglobin. This change is an example of which mutation?
A. Addition
B. Substitution
C. Inversion
D. Deletion

67. Stanley Miller conducted spark-discharge experiment by taking a mixture of gases that he thought to represent the primitive atmosphere of the Earth. All of the following were found in his gas mixture **EXCEPT**
A. NH_3
B. CH_4
C. H_2
D. CO_2

68. Which one of the following sentences explains the Darwin theory of evolution?
A. Environment changes, creating a need for organism to change.
B. There is a natural variation in features that are heritable.
C. New features acquired in lifetime are passed to the offspring.
D. There is development of new feature in order to survive.

69. Comparative anatomy provides evidence of evolution because it
A. looks at structural similarities of organisms.
B. has remains of animals and plants from the remote past.
C. has an impression of animal even if the actual parts are missing.
D. studies the development of the embryos of vertebrates.

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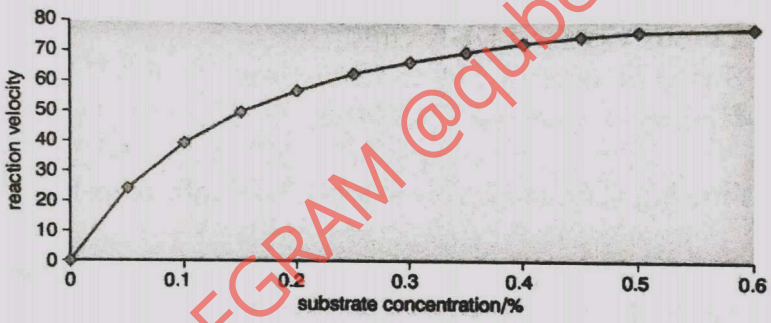
70. About 3 million years ago the Isthmus of Panama separated the shrimp population of the Caribbean Sea and created two populations of shrimps, one on either side of the isthmus. They still look remarkably similar, but they do not interbreed with each other. Which type of isolation is described by this scenario?

A. Seasonal isolation
B. Geographical isolation
C. Behavioural isolation
D. Temporal isolation

71. In a metabolic pathway, the end-product inhibition occurs when the

A. last product of the pathway inhibits the last enzymatic reaction.
B first product of the pathway inhibits the last enzymatic reaction.
C. first product of the pathway inhibits the third enzyme of the reaction.
D. last product of the pathway inhibits the first enzymatic reaction.

72. The following graph shows the rate of reaction of catalase enzyme at a constant temperature and at different substrate concentration (in %).



From the above graph, we can conclude that catalase was functional with its minimum turnover rate from substrate concentration of

A. 0.4 to 0.5.
B. 0.1 to 0.2.
C. 0.5 to 0.6.
D. 0.3 to 0.4.

73. Which one of the following statements is correct about the description of the cell theory?

A. Schleiden and Schwann stated that all cells come from pre-existing cells.
B. Virchow stated that cell is the unit of structure, physiology and organization of living things.
C. Modern cell theory states that cells contain hereditary information that passes from cell to cell.
D. Spontaneous generation theory states that all cells have basically different chemical composition.

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74. A student measured the diameter of onion epidermal cells at a magnification of 100X using a field of view adjusted to 2mm by stage micrometer. What would be the diameter of individual cells if 8 cells fit into the field of view of the microscope at 100X magnification?

A. 250µm C. 150µm
B. 200µm D. 300µm

75. Which of the following characteristics of cells is found only in prokaryotic cell?

A. Division of labor within the cell
B. Continuous loop of DNA
C. 10 -100 µm long
D. Higher level of complexity

76. Which one of the following sentences is true about viruses?

A. AIDS is caused by a DNA virus.
B. Corona virus is a DNA virus.
C. Swine flu is caused by an RNA virus.
D. Herpes simplex is a DNA virus.

77. The following steps are involved when HIV infects its host cell in the human body.

1. Conversion of viral RNA into DNA and its incorporation into cell's DNA.
2. Viral DNA's transcription into viral RNA and production of proteins.
3. Assemblage of new viral particles from RNA, proteins and Reverse Transcriptase
4. The binding of gp120 of HIV to CD4 of a T-Lymphocyte
5. Fusion of HIV with the plasma membrane of the host cell
6. Release of its RNA and reverse transcriptase into the cell.

The logical order of the steps listed above would be

A. 4, 5, 6, 1, 2, 3. C. 4, 6, 5, 2, 1, 3.
B. 4, 2, 5, 6, 1, 3. D. 4, 1, 2, 5, 6, 3.

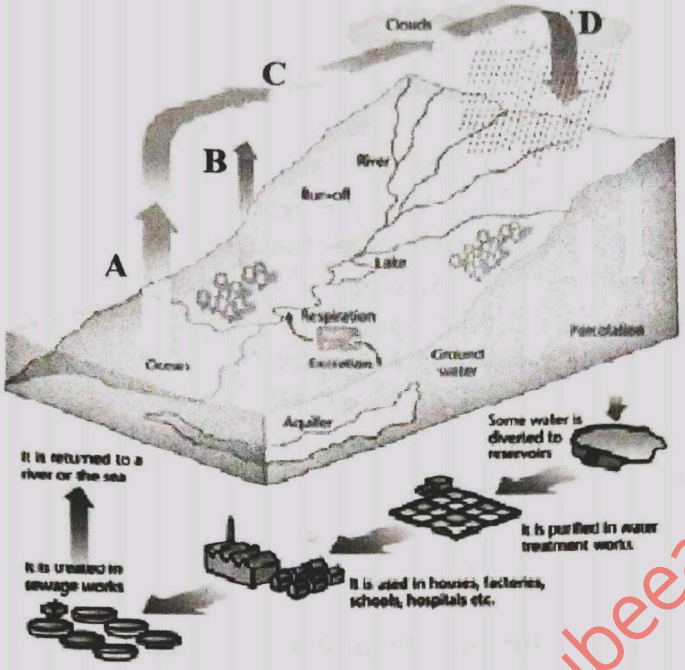
78. Which one of the following bacteria produces ammonium ion by forming a symbiotic association with peas and beans?

A. Klebsiella C. Psuedomonas
B. Azotobacter D. Rhizobium

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79. This item is based on the following diagram which depicts the water cycle.



In the above diagram, the letters A,B,C and D respectively represent

A. evaporation, transpiration, condensation, precipitation.
B. evaporation, precipitation, transpiration, condensation.
C. evaporation, transpiration, precipitation, condensation.
D. evaporation, precipitation, condensation, transpiration.

80. Which one of the following comparisons is true about primary and secondary successions? Secondary succession has

A. reduced species diversity.
B. reduced total biomass of the community.
C. has slower progress to reach to the climax.
D more stable community.

81. Which one of the following sentences describes the tropical rainforest biome? It has

A. poor and thin soil.
B. sparse - succulent plants.
C. frozen and rocky soil.
D. migrating animals.

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82. Fresh water biomes like streams and rivers are characterized by the presence of
A. corals, crabs and planktons.
B. algae, planktons and fish.
C. corals, kelps and angler fish.
D. angler fish, algae and crabs.

83. Which one of the following statements correctly describes intra-specific and inter-specific competitions? In intra-specific competition the
A. competition is less severe but in inter-specific competition it is more.
B. competition is for a few requirements but in inter-specific competition the competition is for all requirements.
C. competing individuals have similar adaptation but in inter- specific competition the adaptation is different.
D. competing individuals belong to different species but in inter- specific competition the individuals are of the same species.

84. Which one of the following stages of cell division is correctly described in meiosis II?
A. Prophase II - pairs of homologous chromosomes split up
B. Anaphase II - chromatids from each chromosome separate
C. Metaphase II - chromosomes pair and exchange segments
D. Telophase II - two haploid cells are produced

85. Which one of the following events is an example of a sex influenced trait?
A. Pattern baldness
B. Lactation
C. Ritinitis pigmentosa
D. Undescended testicles

86. Which of the following processes takes place when lactate is produced?
A. NAD and FAD are regenerated from reduced NAD and FAD.
B. ATP is produced through oxidative phosphorylation.
C. Protons accumulation created in the inter-membrane space.
D. Reduced NAD supplies hydrogen and becomes oxidized itself.

87. Which one of the following structures of the photosystem is correctly related with its function?
A. Chlorophyll a - a reaction center molecule
B. Antenna complex -light dependent reaction begins
C. Carotenoid - provides the hydrogen ions
D. Thylakoid - absorbs blue and red pigments

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88. What happens during the electron transport system of respiration? The
A. four-carbon compound undergoes molecular transformation to generate oxaloacetate.
B. hydrogen atoms carried by FADH and NADH are released and split into protons and electrons.
C. citrate losses a carbon atom to form a five-carbon atom compound and CO_2.
D. five carbon compound is further decarboxylated to form a four-carbon compound.

89. During light independent reactions of photosynthesis, glucose is synthesized through
A. synthesis of reduced NADP that provides hydrogen ion.
B. six turns of the Calvin cycle to make one molecule of glucose.
C. release of hydrogen ions at the electron transport chain.
D. transmission of electrons to the inside of the thylakoid.

90. Which one of the following factors of photosynthesis is correctly matched with its effect?
A. CO_2 concentration - limits the reactions by influencing rate of initial reaction with RuBP
B. Low temperature - limits the rate of reactions by reducing the number of electrons in the chlorophyll
C. Low Rubisco - limits the number of reactions in the light dependent reaction
D. Light intensity - limits the rate of ATP synthase enzyme action in light dependent reactions

91. Which one of the following monohybrid crosses can be a test cross?
A. Rr X Rr
B. RR X Rr
C. RR X rr
D. RR X RR

92. Which of the following is different from the rest with regard to conservation of vegetation?
A. Using local practices for conservation
B. Replanting of land with endemic species
C. Replanting indigenous tree species
D. Large scale introduction of exotic plants

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93. In the nervous co-ordination system, which of the following statements explains the synapse? It is a
A. chemical that transmits nerve impulses across the nervous system.
B. part of the skull that encloses brain for the purpose of protection.
C. junction between two neurons or a neuron and a muscle.
D. short term change in the electrical potential on the surface of cells.

94. Two students want to demonstrate a simple spinal reflex action using the knee jerk reflex. One of them sits down with one leg loosely crossed over the other. The other hits the crossed leg just below the knee cap gently but firmly using the edge of his hand. Which one of the following situations will happen during this demonstration? The
A. impulse travels to the brain.
B. hit ligament stretches the muscle.
C. lower leg to jerk downwards and inwards.
D. impulse travels to quadriceps muscle from the brain.

95. Which of the following eye structures is correctly matched with its function?
A. Pupil - serves as the eye's protective outer layer.
B. Iris - controls the amount of light entering the eye.
C. Cornea - provides nutrition to the retina.
D. Choroid - bends the light into the eye.

96. In the CAM photosynthetic pathway,
A. malate is stored in the mesophyll cells during the day.
B. glucose is synthesized in the bundle sheath cell during night.
C. ATP and NADPH are produced during the night.
D. the C4 stage and the Calvin cycle are separated in time.

97. In Gram staining, if some bacteria retain the crystal violet after counter staining, then the bacteria is
A. Gram positive.
B. Gram negative.
C. Gram intermediate.
D. Gram variable.

98. Which one of the following sentences explains the mechanism of bacterium to produce disease?
A. Its hyphae secrets enzymes which digest substances in the tissue.
B. It enters into the living cells and disrupts the metabolic systems.
C. It attaches with white blood cells and destroy the immune system.
D. Its genetic material is incorporated into the cell for instruction.

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99. Which one of the following sentences explains the role of bacteria in genetic engineering? They are used to
A. isolate genes from donor DNA.
B. open up a plasmid.
C. cut genes from donor DNA.
D. contain a recombinant plasmid.

100. Which one of the following sentences describes a virus? It
A. has differentiated organelles.
B. is saprophytic.
C. is acellular.
D. undergoes respiration.

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The End

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