

Biology, 2013 EC, entrance exam, round 1, booklet 12

Grade 12 · Biology · 2013 E.C.

Time allowed: 120 minutes

Questions: 95

Total marks: 95

Name _____ Grade _____ ID No. _____ Date _____

1. Which one of the following is true about the importance of Lucy in resolving debates about human evolution? (1)
 - A. Big brains came before bipedalism.
 - B. Lucy had a brain size of 1.8% of her body mass.
 - C. Bipedalism came before big brains.
 - D. Lucy was partially an arboreal primate.

2. Which one of the following can best explain behavior? It is (1)
 - A. the co-ordinated response of an organism to an internal or external stimuli.
 - B. the tendency for parts of plants to grow towards light.
 - C. the actions or reactions of a person or animal in response to external or internal stimuli.
 - D. a cell or group of cells that receives and processes stimuli.

3. The quick withdrawal of your hand from a hot plate is an example of (1)

A. fixed action pattern	B. innate behavior
C. biological clock	D. key stimulus

4. Which one of the following processes describes a biological clock? (1)
 - A. Removal of one's thumb from hot objects quickly
 - B. The growing of plants towards light
 - C. Circannual migration of birds from temperate to tropical areas
 - D. Kinesis and taxes of woodlice and other simple animals

5. Identify learned behavior from the following. (1)

A. Dog trained to hunt.	B. Honey bee making honey.
C. Child withdraws hand from hot things.	D. Ants making nest.

6. Which one of the following features is unique to bacteria? (1)

A. Presence of permeable membrane	B. Being unicellular
C. Absence of nuclear membrane	D. Having flagella for locomotion

7. This item is based on the diagram which shows the different shape of bacteria below. What is the correct name of the shape of bacteria represented by letters A, B and C, respectively? (1)
- [Figure: A scanned drawing showing three groups of bacterial cells side by side, each with a leader line and a bold capital letter label. Left group, labelled A: three long, thin, wavy corkscrew-like filaments drawn with several regular waves each, lying loosely parallel (spiral / spirochaete form). Middle group, labelled B: about ten small round cells scattered across the field, some single, several joined in pairs and one short chain of two or three touching cells (spherical / coccus form). Right group, labelled C: six short, thick, blunt-ended rod cells drawn at various angles, most of them joined end to end in pairs (rod / bacillus form). The cells are coloured grey, dark red and olive; the scan carries a faint bleed-through of text from the reverse of the page and a small 'Scanned with CamScanner' watermark at bottom left. No scale, no other text or values appear in the figure.]*
- A. Rod, spirochaete, sphere
B. Sphere, rod, spirochaete
C. Flagellated bacilli, clusters, spirilla
D. Spirochaete, sphere, rod
8. It is possible to produce human insulin in a bacterial strain. The insulin gene should be inserted in a plasmid and the recombinant DNA plasmid should be inserted into a bacterium. What is the role of the bacterium in this process? (1)
- A. The source of insulin and modification
B. The source of plasmid and insulin production
C. Multiplying the recombinant DNA molecule
D. Joining the gene of insulin with the gene of plasmid
9. Bacteria can cause diseases in all of the following mechanisms EXCEPT (1)
- A. changing the genetic structure of host cells.
B. entering living cells and disrupting metabolic systems.
C. releasing toxins as they multiply.
D. invading and growing on the tissues of organs.
10. Functional diseases differ from infectious diseases in that they (1)
- A. are caused by microorganisms.
B. occur in the brain and heart.
C. are common in females than males.
D. show no signs of damage on the organ.
11. This item is based on the drawing of a bacteriophage given below. In the above diagram of a bacteriophage, DNA and Protein coat are respectively represented by (1)
- [Figure: A scanned drawing of a T-even bacteriophage standing upright, with three numbered leader lines. The virus has an elongated six-sided (hexagonal) head drawn as a grey shell whose wall is shown as a row of small repeating subunits; inside the hollow head a single dark red and grey coiled thread winds up and down. Below the head is a straight vertical tail: a narrow collar, then a longer sheath drawn with a beaded or ridged edge, ending in a base plate. Six long, thin, sharply bent legs (tail fibres) splay out from the base plate, three to each side, each bending at a knee roughly halfway down. Label 1 is at the top left, its line running down into the head to touch the coiled thread inside it. Label 2 is at the top right, its line running down to the wall of the head. Label 3 is at the bottom right below the legs, its line running up to one of the bent tail fibres. No other text, units or values appear in the figure; the scan shows faint bleed-through from the reverse of the page.]*
- A. 2 and 3.
B. 1 and 3.
C. 1 and 2.
D. 2 and 1.
12. The social impact of AIDS can be mainly revealed by (1)
- A. fear of stigmatization
B. loss of appetite
C. reduced labor force
D. loss of body weight

22. Which one of the following is the basic characteristic of mutation? It is (1)

- A. spontaneous.
- B. planned.
- C. regular.
- D. expected.

23. The theory that suggests "life can evolve autonomously from non-living objects" is known as (1)

- A.** cosmozoan theory.
- B.** spontaneous generation theory.
- C.** biochemical theory.
- D.** eternity theory.

24. Which one of the following is true about neo-Darwinian theory? (1)

- A. There is a natural variation in features and variations which are heritable.
- B. All species tend to produce more offspring than can possibly survive.
- C. It takes into account genetics and animal behavior to understand evolution.
- D. Development of new feature is important for survival.

25. Which one of the following statements describes the evolutionary theory of Lamarck? (1)

- A. Acquired characteristics cannot be inherited.
- B. Structures commonly used become more developed.
- C. Origin of species happens only through natural selection.
- D. Species started complex and gradually become simple.

26. The behavior which trainers look, if modified, could lead to the desired behavior and reward such a behavior is (1)

- A. innate.
- B. instinct.
- C. reflex.
- D. operant.

27. Which one of the following examples of behavior describes when an animal stops responding to stimulus or cue after a period of repeated exposure?

- A. Imprinting
B. Reflex
C. Habituation
D. Conditioning

28. Which one of the following behaviors is a courtship behavior? (1)

- A.** Touch **B.** Scent marking
C. Ritual fighting **D.** Defending a den

29. The Ethiopian wolf (*Canis simensis*) lives and hunt in packs. During patrolling their habitat, both male and female wolves of the group maintain their area with urine containing pheromone. This pattern of behavior best exemplifies

- A. courtship behavior.
- B. territorial behavior.
- C. operant behavior.
- D. learned behavior.

30. The terrestrial biome characterized by cold temperature, dry precipitation, frozen soil and inhabited by migrating birds is (1)

- A. boreal forests.
- B. deserts
- C. tropical montane forests.
- D. tundra.

-
- 31.** This item is based on the table below. | Biome | Soil | Animals | | Desert (hot) | L | M | | Tropical montane forest | N | O | Select the correct representatives for L, M, N and O, respectively (1)
- A. Fertile, many animals, poor, few animals
 - B. Poor, sparse, fertile, many animals
 - C. Fertile, migratory animals, poor, drought and fire adapting animals
 - D. Medium, ants and spiders, poor, polar bears
-
- 32.** Which one of the following explains biodiversity? (1)
- A. The variability among living organisms, within species, and of ecosystem
 - B. The large number of human races in the world
 - C. The similarity and difference of organisms which live in different ecosystems
 - D. Large number of organisms in the same ecosystem
-
- 33.** This item is based on the table below which shows an 'invented' ecosystems. Number of organisms of each species | Species | Area 1 | Area 2 | Area 3 | | A | 86 | 16 | 23 | | B | 5 | 17 | 25 | | C | 2 | 16 | 27 | | D | 3 | 17 | 5 | | E | 1 | 17 | 12 | | F | 3 | 17 | 8 | In which area of the above table does all of the species are more or less equally successful? (1)
- A. Area 2
 - B. Area 1
 - C. Area 1 and 3
 - D. Area 1 and 2
-
- 34.** What is the major difference that viruses have with free living cells? Viruses (1)
- A. reproduce only asexually.
 - B. lack genetic material of their own.
 - C. do not function outside of a living cell.
 - D. lack locomotory structure.
-
- 35.** Why is nutrient recycling important in an environment? Because (1)
- A. the amount of nutrients in the environment is limited.
 - B. it adds new types of molecules into the environment.
 - C. nutrients in an environment will be depleted if recycled.
 - D. nutrients should be exchanged between the earth and other planets
-
- 36.** Which one of the following orders of life processes correctly illustrates occurrence of the nutrient cycle? (1)
- A. feeding → death and decomposition → excretion → respiration and breathing
 - B. feeding → excretion → respiration and breathing → death and decomposition
 - C. death and decomposition → feeding → excretion → respiration and breathing
 - D. respiration and breathing → feeding → excretion → death and decomposition
-
- 37.** Which of the following processes in the phosphate cycle DOES NOT return phosphate ions to the soil? (1)
- A. Weathering of rocks
 - B. Use of fertilizers
 - C. Decomposition of dead animals
 - D. Cellular respiration
-
- 38.** A previously bare land was gradually occupied by lichen and mosses, annual herbs, perennial herbs, shrubs and finally by forests. Which one of the following best describes the process indicated above? (1)
- A. Afforestation
 - B. Succession
 - C. Climax community
 - D. Natural Selection

39. This item is based on the table below. | Condition | Population size | | Natality exceeds mortality | X | | Mortality exceeds natality | Y | | Mortality and natality are equal | Z | The population number of X, Y, and Z, respectively will (1)
- A. decrease, increase, remain the same. B. increase, decrease, remain the same.
C. decrease, remains the same, increase D. remain the same, increase, decrease.
-
40. This item is based on the table below which shows population growth trend. | Time period | Numbers in population X | Numbers in population Y | | 0 | 5 | 40 | | 1 | 10 | 80 | | 2 | 15 | 160 | | 3 | 20 | 320 | | 4 | 25 | 640 | | 5 | 30 | 1280 | | 6 | 35 | 2560 | | 7 | 40 | 5120 | Which one of the following is correct about X and Y? (1)
- A. X is exponential growth because the numbers increase by the same fixed amount in each time period and Y is arithmetic growth because the population doubles in each time period.
B. X and Y cannot be compared because each of them grow differently with incomparable proportion.
C. X is arithmetic growth because the numbers increase by the same fixed amount in each time period and Y is exponential growth because the population doubles in each time period.
D. Both X and Y are exponential growth since each of them increase regularly without interruption.
-
41. *Drosophila melanogaster* are convenient experimental animals in genetics. Because they (1)
- A. have 23 pairs of chromosomes per cell.
B. are small animals with a short life cycle.
C. are too cheap to breed in large numbers.
D. have chromosomes that can't be easily detected,
-
42. Suppose a heterozygous brown eye father is married with a blue eye mother. What would be the proportion of homozygous children for eye color? (Hint: Brown is dominant over blue) (1)
- A. 50% B. 100%
C. 75% D. 25%
-
43. The following question is based on the figure that shows the gains in productivity from hybrid vigour. In the above diagram, what best describes the breeding condition represented by letter X, and Z, respectively? (1)
- [Figure: A scanned photograph of a printed bar chart. The vertical axis is labelled "improvement in yield (%)" and is scaled 0, 5, 10, 15, 20, 25 with faint horizontal grid lines. Three positions are marked along the horizontal axis and labelled with bold capital letters X, Y and Z, left to right; the axis itself carries no title. There is no bar at X, only the value "0%" printed just above the axis at that position. A solid dark bar stands at Y reaching just above the 9 level, with "9%" printed above it. A taller solid dark bar stands at Z reaching just above the 23 level, with "23%" printed above it. Both bars are the same width and the plot area is grey. Nothing else is drawn or labelled; a small 'Scanned with CamScanner' watermark sits at the bottom left of the image.]*
- A. X involves cross breeding and Z involves inbreeding.
B. X involves inbreeding and Z involves cross breeding.
C. X represents natural selection and Z represents artificial selection.
D. Both X and Z represent inbreeding.
-
44. If organisms share very similar molecules such as DNA, then they must be closely related evolutionarily. Which evidence of evolution supports the above information? (1)
- A. Comparative embryology B. Comparative anatomy
C. Comparative physiology D. Comparative biochemistry
-
45. Which one of the following CANNOT be used as an evidence of evolution through paleontology? (1)
- A. Stomach B. Teeth
C. Hair D. Bones

46. The process in which individuals with a particular heritable trait survive better than the other is (1)

- A. adaptation.
- B. evolution.
- C. selective breeding.
- D. natural selection,

47. Which type of selection favors individuals at both extremes of a range to have some advantage over those displaying the mean value? (1)

- A.** Stabilizing selection **B.** Directional selection
C. Natural selection **D.** Disruptive selection

48. Which one of the following is true about the human evolution? (1)

- A. Humans and chimpanzees both evolved from a common ancestor.
- B. Humans evolved from chimpanzees.
- C. Humans evolved from different line of evolution than great apes.
- D. Humans evolved from great apes.

49. Which one of the following organic molecules is used to make haemoglobin? (1)

- A.** Glycogen **B.** Lipids
C. Proteins **D.** Nucleic acids

50. Which one of the following is the correct formula of maltose? (1)

- A. $C_6H_{12}O_6$
B. $C_{12}H_{24}O_{12}$
C. $C_5H_{10}O_5$
D. $C_{12}H_{22}O_{11}$

51. A grade 11 student added Benedict's reagent on food sample and heated the mixture for 5 minutes. Then he observed a color change. Which one of the following is FALSE about the result? (1)

- A. An orange colour shows that a reducing sugar is present.
B. A yellow colour shows that a reducing sugar is present.
C. An orange colour shows that a non-reducing sugar is present.
D. A red colour shows that a reducing sugar is present.

52. In a Benedict's test for sucrose, why does the test sample first boil with hydrochloric acid? (1)

- A. To reduce Benedict's solution
- B. To neutralize the solution
- C. To hydrolyze non-reducing sugar
- D. To retest the mixture with Benedict's solution

53. Which one of the following statements explains the specificity of enzymes? Enzymes (1)

- A. catalyse one reaction only.
- B. speed up a reaction without being used up.
- C. can be destroyed by excessive heat.
- D. can be used over and over again.

54. The relevance and promise of biological sciences can be demonstrated by their contribution in (1)

- A. finding mechanisms to feed the growing human population.
- B. finding solutions to ethnic conflicts.
- C. development of housing and construction sectors.
- D. advancement of aviation technology.

-
- 55.** All are the roles of biology to combat the spread of HIV/AIDS EXCEPT (1)
- A. producing drugs that can stop the virus from reproducing
 - B. breaking the transmission pathway.
 - C. raising fund for infected people.
 - D. producing a vaccine against the virus.
-
- 56.** Which one of the following statements is INCORRECT about AIDS? The rate of transmission of AIDS will reduce when (1)
- A. the transmission path ways is broken.
 - B. promiscuous sexual intercourse is reduced.
 - C. the number of sexual partners is restricted.
 - D. men and women are circumcised.
-
- 57.** Which one of the following statements explains the property of water? It (1)
- A. takes less energy to heat water up.
 - B. has the lowest latent heat of vaporization.
 - C. is a transparent molecule.
 - D. is highly viscous substance.
-
- 58.** Suppose there are two communities in a village. Community A actively participates in HIV/AIDS awareness creation, HIV prevention and gets blood test for HIV whereas community B frequently requests for food aid, participates only in afforestation activities and HIV positive individuals keep the secret to themselves. In which community do you think that the incidence of HIV/AIDS most probably high? (1)
- | | |
|-------------------------|-------------------|
| A. In both communities | B. In community B |
| C. Impossible to decide | D. In community A |
-
- 59.** Which property of water is useful for life that it continues in relatively warm water underneath through the cold weather? (1)
- A. High specific heat capacity
 - B. High density in its solid form than its liquid form
 - C. High surface tension
 - D. High latent heat of vaporization
-
- 60.** Consider the following table which contains organic and inorganic molecules. Which rows contain the corresponding organic and inorganic molecules correctly? | No | Organic Molecules | Inorganic Molecules | | 1 | Lysine, sucrose | Salts, hydrochloric acid | | 2 | Deoxyribose, carbon monoxide | Fructose, sodium chloride | | 3 | Fatty acid, methane | Sodium hydroxide, carbon dioxide | | 4 | Water, calcium carbonate | Stearic acid, starch | Which rows contain the corresponding organic and inorganic molecules correctly? (1)
- | | |
|------------|------------|
| A. 2 and 3 | B. 1 and 2 |
| C. 3 and 4 | D. 1 and 3 |
-
- 61.** Cellulose is (1)
- | | |
|--|---|
| A. a mixture of amylose and amylopectin. | B. a polymer of β -glucose molecule. |
| C. a non-reducing monosaccharide sugar. | D. a polymer of α -glucose molecule. |

-
- 62.** Which organic molecules are formed when two fatty acid molecules are bounded to the glycerol and the place of the third is taken by a phosphate group? (1)
- A. Waxes
B. Glycolipids
C. Triglycerides
D. Phospholipids
-
- 63.** All are the function of lipids EXCEPT (1)
- A. thermal insulation.
B. water proofing.
C. respiratory substrates
D. determines a particular features.
-
- 64.** Three different cells are in the process of transporting materials across the cell membrane as indicated below: (1)
Cell 1 = water from high concentration to low concentration
Cell 2 = Na^+ from high concentration to low concentration
Cell 3 = glucose from low concentration to high concentration
Which types of transport mechanism do the above cells use, respectively?
- A. Osmosis, facilitated diffusion, active transport
B. Osmosis, active transport, facilitated diffusion
C. Facilitated diffusion, osmosis, active transport
D. Facilitated diffusion, active transport, osmosis
-
- 65.** Suppose you took a container and divided it into two halves by a membrane which is permeable to water and labeled the two halves as A and B. Finally, you added hypertonic solution in A and hypotonic solution in B. What will be the expected result of this experiment? (1)
- A. Rise of the water level in both halves
B. Rise of the water level in B
C. Rise of the water level in A
D. No change in both halves
-
- 66.** A student did an experiment and found out that catabolism of amino acid produces toxic ammonia in the liver cells which gradually get converted into urea and excreted through urine. What would be the result of the experiment if osmosis was blocked? The liver cells (1)
- A. gain water and become turgid.
B. excrete more ammonia and urea.
C. become over active and produce more energy.
D. become damaged and lose functionality.
-
- 67.** Consider the following key events in the study of cell biology. I. Hooke describes 'cells' in a cork. II. Leeuwenhoek discovers protozoa. III. Schleiden and Schwann propose a cell theory. IV. Jansen builds the first compound microscope. Which one of the following represents the correct order from ancient to the recent? (1)
- A. I, II, III and IV
B. IV, I, II and III
C. III, II, I and IV
D. II, III, IV and I
-
- 68.** One of the differences of prokaryotic and eukaryotic cells is their cell wall. This is because cell wall of prokaryotic cell is (1)
- A. the site of energy production.
B. impermeable.
C. stronger than eukaryotic cells.
D. made from sugar and amino acid.
-
- 69.** Consider the following features of cells. I. have pili II. have chromosome III have circular DNA IV. have larger ribosomes Which of the above features of cells can be included in eukaryotic cells? (1)
- A. II and III
B. I and II
C. II and IV
D. I and III

-
- 70.** Which of the following is correct about the structure of the cell membrane? (1)
- A. Phospholipid molecules form a transport channel.
 - B. Protein molecules form a double layer.
 - C. The membrane has a fluid nature that is regulated by cholesterol.
 - D. Proteins form the outer layer while phospholipids form the inner layer.
-
- 71.** Which of the following is a correct match of cellular organelles and their corresponding function? (1)
- | | |
|--|---|
| A. Vacuole strength and elasticity | B. Mitochondria - ATP synthesis |
| C. Lysosome - modification of proteins | D. Golgi body - digesting foreign cells |
-
- 72.** What structural arrangements make chlorophyll suit for its function? (1)
- A. The floating of the photosystems and the electron transport chain in the cytosol.
 - B. The fixing of the photosystems and the electron transport chain on thylakoid membrane.
 - C. The structural differences between Photosystem I and Photosystem II.
 - D. The long distance between Photosystem I and Photosystem II.
-
- 73.** Why does photorespiration take place in a hot environment? Because plants close their stomata and face (1)
- | | |
|---------------------------------|------------------------------|
| A. H ₂ O shortage | B. CO ₂ shortage. |
| C. O ₂ accumulation. | D. O ₂ shortage |
-
- 74.** This item is based on the diagram of chloroplast given below. Which letters represent the site where photolysis and Calvin take place, respectively? (1)
- [Figure: A scanned, dark greyscale photograph of a textbook drawing of a chloroplast, shown as a rounded lens-shaped body with a wedge cut away at the upper left so the interior is visible. Six bold capital letters run down the left of the picture, each with a straight leader line pointing into the drawing. A (topmost) points to the outermost of the envelope layers along the cut edge of the wedge. B, just below it, points to the next layer in along that same cut edge. C points further in, to the stacked disc-like structures (grana of thylakoids) that fill the exposed interior. E, lower on the left, points to the rim of the cut face at the level of the lower half of the organelle. F, below E, points to the pale ground substance filling the space around the stacks in the lower half of the body (stroma). D, at the bottom, points with a short line up to the smooth outer surface of the intact lower part of the chloroplast. The interior stacks are drawn as several piles of flattened discs joined by connecting sheets. The letters are the only labels; no names, scale bar or values are printed on the figure. The scan is low contrast with faint text bleeding through from the reverse of the page and a small 'Scanned with CamScanner' watermark at the bottom left.]*
- | | |
|------------|------------|
| A. D and F | B. C and E |
| C. B and A | D. F and E |
-
- 75.** Which of the following is correct about the process of glucose production in the light-independent reactions of photosynthesis? (1)
- A. A total of 9 ATP molecules are synthesized.
 - B. CO₂ reacts with GP to form RuBP.
 - C. One TP is directly converted to one glucose molecule.
 - D. GP is reduced to TP by reduced NADP.

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76. Which of the following is a correct description of the CAM pathway of photosynthesis? (1)
- A. CO_2 is stored in the form of malate during the night.
 - B. The Calvin cycle takes place during the night.
 - C. The Calvin cycle takes place in the bundle sheath cells during the day.
 - D. CO_2 is stored in the bundle sheath cells during the night.
-
77. Which one of the following statements explains how an enzyme lowers the activation energy of a reaction? By (1)
- A. enabling the reaction to occur at lower physiological temperature
 - B. making the individual substrate molecules more reactive
 - C. lowering the kinetic energy of the reacting molecules
 - D. changing its tertiary structure into secondary protein structure
-
78. Consider the following chemical reaction below. $RH_2 + A \xrightarrow{E} R + AH_2$ Based on the above chemical reaction, in which classes of enzymes can enzyme "E" be grouped? (1)
- | | |
|-----------------|--------------------|
| A. Transferases | B. Hydrolyases |
| C. Isomerases | D. Oxidoreductases |
-
79. Which one of the following enzymes is used as washing powders? (1)
- | | |
|----------------|--------------|
| A. Biochymosin | B. Lipase |
| C. Cellulase | D. Pectinase |
-
80. What happens when the substrate molecule binds to the active site of an enzyme? (1)
- A. The substrate and the enzyme will bond permanently.
 - B. They form a stable intermediate substance.
 - C. The amino acids in the active site become unreactive.
 - D. The chemical bonds of the substrate are distorted.
-
81. How does crossing over during meiosis bring variation in species? By (1)
- A. increasing the amount of genes in one of the parents during meiosis
 - B. combination of genes in the gametes that are not found in either parent
 - C. combining sex and somatic cell chromosomes
 - D. creating genes that are not found in both parents due to meiosis
-
82. How does our body synthesize some of the amino acids in our body? From (1)
- A. fatty acids we consume
 - B. intermediate molecules of different pathways
 - C. breaking down of pre-existing proteins
 - D. biological breakdown of our own cells
-
83. This item is based on the following list of events during cloning of an insulin gene into a plasmid. I. Obtaining insulin-producing cells and plasmid from organisms II. Cutting the insulin gene and plasmid III. X IV. Inserting the recombinant plasmid into bacteria V. Production of insulin by bacteria Which one of the following best represents the step listed as "X"? (1)
- A. Inserting the insulin gene into a bacterium
 - B. Inserting the open plasmid into a bacterium
 - C. Fusing the insulin and plasmid genes to the cell wall of bacteria
 - D. Combining the insulin gene into the opened plasmid

84. Consider the DNA molecule containing: Strand 1: T A C G T A Strand 2: A T G C A T What will be the sequence of the new DNA if the DNA replicates semi-conservatively? (1)

A. ATGCAT UACGUA
B. TACGTA ATGCAU
C. ATGCAT ATGCAT
D. TACGTA ATGCAT

85. During translation the (1)

A. tRNA serves as a template of the DNA molecule.
B. ribosome moves forward over two codons at a time.
C. mRNA brings amino acids into the ribosomes.
D. tRNA with complementary anticodon binds on the codon of mRNA.

86. The step of scientific method which comes after analyzing results and draw conclusion is (1)

A. doing background research.
B. constructing hypothesis.
C. designing and carrying out experiment.
D. accepting or rejecting the hypothesis.

87. In a group of individuals in which group A was a control and group B was an experimental group, a student gave a placebo to the control group, and an unknown drug to the experimental group. At the end, the experimental group got better. Which one of the following is true about the result? (1)

A. The drug has an effect.
B. Placebo has better effect.
C. The experiment was wrong.
D. Conclusion cannot be reached.

88. A biologist conducted simple experiment to investigate the effect of pH on salivary amylase. She added 5 cm³ amylase solution into 5 cm³ starch suspension with a neutral pH in a test tube. After ten minutes, she tested it with iodine reagent and the solution turned into blue-black color. What is the dependent variable of this experiment? (1)

A. Applying iodine treatment
B. pH of the solution
C. Adding salivary amylase
D. Formation of blue-black color

89. Which one of the following pairs of biological tools and their functions is FALSE? (1)

A. Petri dish -used for culturing microorganisms
B. Balances-used for measuring mass
C. Quadrant- to separate solids from liquids
D. Optical microscope- use beam of light to produce magnified image

90. Grade 12 students went to a field and collected plant specimens for identification in the laboratory. They wanted to preserve the plant parts for some times and specimens can be analyzed later. Which one of the following biological tool is used for their activities? (1)

A. Plant press
B. Pitfall traps
C. Theodolite
D. Quadrat

91. Some amino acids are synthesized using transamination process in the cell. This activity more describes the cell's (1)

A. replication.
B. catabolism.
C. energy production.
D. anabolism.

-
- 92.** Identify the statement that correctly explains the factors of an enzyme activity. (1)
- A. Excessive heat breaks the ionic bonds that hold the tertiary structure of the enzyme protein.
 - B. Hydrogen ion concentration affects the ionic bonds of an enzyme.
 - C. Increasing concentration of substrates does not affect enzyme activity.
 - D. Inhibitors increase enzyme activity by increasing their turnover rate.
-
- 93.** Which one of the following is true about allosteric regulation? (1)
- A. Enzymes are activated when activators attached on the active site.
 - B. Inhibition by competitive inhibitors when it interacts on the allosteric site.
 - C. Activation by activators when it interacts on the allosteric site.
 - D. Allosteric inhibition is occurred when inhibitors attached on the active site.
-
- 94.** If an enzyme from thermophilic bacteria, which catalyses glucose 6- phosphate into fructose 6-phosphate in the process of glycolysis, is subjected to below the optimum temperature, the rate of reaction will be decreased. This is because (1)
- A. the particles have more kinetic energy
 - B. the enzyme is denatured.
 - C. more collisions between enzyme and glucose 6-phosphate occurred.
 - D. less enzyme - glucose 6-phosphate complexes formed.
-
- 95.** Cyclooxygenase-2 is an enzyme that catalyzes the conversion of arachidonic acid to prostaglandins, which promote pain and fever in our body. The pain killer ibuprofen, act as non-competitive inhibitor of cyclooxygenase-2, reduces the production of prostaglandins. What would happen if the concentration of the ibuprofen increased? (1)
- A. Pain of the body is decreased.
 - B. Production of prostaglandin is increased.
 - C. Concentration of arachidonic acid is decreased.
 - D. Substrate affinity of cyclooxygenase-2 is higher.

— END OF EXAMINATION —