Ethiopian University Entrance Examination (EUEE)
Biology
Ginbot 2011/June 2019

BOOKLET CODE: 31
Number of Items: 100

SUBJECT CODE: 06
Time Allowed: 2hours

DIRECTIONS: For each of the following problems, choose the best answer from the given alternatives and carefully **blacken** the letter of your best choice on the separate answer sheet provided.

1. Which of the following is the Greek word for life?
   (A) *'Logos'* (B) *'Bios'* (C) *'Cientia'* (D) *'Cell'*

2. What is the shape of an enzyme molecule?
   (A) Globular (B) Linear (C) Branched (D) Pleated

3. In which of the following groups of organisms are all the members unicellular?
   (A) Algae (B) Fungi (C) Bacteria (D) Viruses

4. Which of the following chromosomal errors creates a cell with an extra chromosome?
   (A) Non-disjunction (C) Deletion
   (B) Inversion (D) Duplication

5. What is the type of scientific research that is directly concerned with studies of the way of solving problems related to human needs?
   (A) Basic science (C) Space science
   (B) Applied science (D) Current science

6. For which of the following purposes do biologists use centrifuges?
   (A) Measuring volume (C) Culturing microorganisms
   (B) Magnifying cell parts (D) Fractionation of cell contents

7. What is the function of DNA polymerase?
   (A) It hydrolyzes the DNA molecule.
   (B) It forms DNA by joining nucleotides.
   (C) It converts the DNA molecule to RNA.
   (D) It joins two RNA molecules to form DNA.

8. Which one of the following is commonly called the code of life?
   (A) Cell (B) Organelle (C) Nucleus (D) DNA

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9. What is another name for secondary consumer?
   (A) Producer
   (B) Herbivore
   (C) Carnivore
   (D) Decomposer

10. Which type of chromosome mutation causes the human genetic defect known as trisomy 16?
   (A) Duplication
   (B) Translocation
   (C) Deletion
   (D) Chromosome inversion

11. In which geologic period is the evolution of humans most probably believed to have happened?
   (A) Tertiary period
   (B) Jurassic period
   (C) Quaternary period
   (D) Cretaceous period

12. Of the following patterns of innate behaviour in animals, which one is considered the simplest?
   (A) Instinctive behaviour
   (B) Reflex action
   (C) Taxis movement
   (D) Kinesis movement

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13. The hypothesis which a scientist tries to disprove is called:
   (A) Alternative hypothesis
   (B) Ad hoc hypothesis
   (C) Null hypothesis
   (D) Auxiliary hypothesis

14. What are the compounds that have the same chemical composition, but different arrangement of atoms?
   (A) Anomers
   (B) Isomers
   (C) Polymers
   (D) Monomers

15. Which one of the following conditions is least likely to denature an enzyme?
   (A) A high temperature
   (B) An extreme pH
   (C) Heavy metal ions
   (D) A low temperature

16. Respiration is:
   (A) Anabolic and exergonic
   (B) Anabolic and endergonic
   (C) Catabolic and exergonic
   (D) Catabolic and endergonic

17. Both photosynthesis and respiration are involved in:
   (A) Nitrogen Cycle
   (B) Phosphorous Cycle
   (C) Water Cycle
   (D) Carbon Cycle

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18. Which of the following statements best describes the role of bacteria in the nitrogen cycle? Bacteria turn:
(A) oxygen into nitrogen for plants to use.
(B) nitrogen into a usable form for plant use called ammonia.
(C) nitrogen into a usable form in a process called transpiration.
(D) carbon dioxide into oxygen during the process of photosynthesis.

19. Which one of the following terms best describes the number of different species in the biosphere or in a particular area?
(A) Biodiversity
(B) Genetic diversity
(C) Ecosystem diversity
(D) Species diversity

20. The daily cycle of activity that occurs over a 24-hour period of time is called a:
(A) Stimulus-response
(B) Kinesis behavior
(C) Circadian rhythm
(D) Taxis behavior

21. Within a few weeks after a heavy rain, pools become teemed with tadpoles. What is the source of the tadpoles?
(A) The rain water
(B) The eggs laid by frogs
(C) The decaying vegetation of the pond
(D) The mud on the floor

22. In what way does an antiretroviral drug help AIDS patients? It
(A) stops the multiplication of HIV.
(B) kills opportunistic infectious agents.
(C) stimulates multiplication of T-helper cells.
(D) provides immunity.

23. Of the following four elements, which one is the least abundant in living things?
(A) Oxygen (B) Hydrogen (C) Carbon (D) Sulfur

24. If a homogenate of eukaryotic cells is spun in a centrifuge, which of the cellular organelles settles out first?
(A) Nucleus (B) Ribosome (C) Chloroplast (D) Mitochondria

25. In which part of mitochondria does the Kreb's cycle take place?
(A) In the matrix
(B) On the inner membrane surface
(C) On the outer membrane surface
(D) In the inter-membrane space

26. What is the ultimate source of the electrons that replace those lost from the photosystem II during photosynthesis?
(A) Photosystem I
(B) Chlorophyll-b
(C) Chlorophyll a
(D) Water

27. Which one of the following human diseases is **NOT** correctly matched with its mode of transmission?
(A) Malaria - vector
(B) Sleeping sickness- physical contact
(C) Cholera - contaminated water
(D) Influenza - droplet infection

28. Which clinical test is routinely performed to diagnose patients for AIDS?
(A) Culturing opportunistic infectious agents
(B) Culturing the virus on a special media
(C) Serological test for anti-HIV antibody
(D) Determining hemoglobin amount

29. Which of the following pairs of processes add CO_2 to the atmosphere?
(A) Combustion and respiration
(B) Respiration and photosynthesis
(C) Photosynthesis and fossilization
(D) Decomposition and combustion

30. Which bacterial genus fixes nitrogen in the nodules of leguminous plants?
(A) Agrobacterium
(B) Escherichia
(C) Rhizobium
(D) Azobacter

31. One of the following agricultural practices does **NOT** have a negative effect on biodiversity?
(A) Use of pesticides
(B) Use of insecticides
(C) Growing improved varieties
(D) Growing landraces

32. On which of the following points do Lamarck's and Darwin' theories of evolution agree?
(A) Evolution produces new species
(B) Evolution occurs by natural selection
(C) All living things tend to over reproduce
(D) New structures arise by use-and-disuse

33. What is the behavior that an animal learns to ignore a trivial stimulus that is repeated many times?
(A) Sensitization
(B) Insight learning
(C) Habituation
(D) Latent learning

34. One of the following is true about a behavior that has a fixe daction pattern.
(A) It is a learned behavior.
(B) It is always done in the same way.
(C) It can be perfected through experience
(D) It does not need a stimulus to trigger it.

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35. If a chimpanzee piles up boxes and climbs on it to reach a bunch of banana hanging from a ceiling, which behavior is manifested?
(A) Operant conditioning
(B) Trial and error learning
(C) Insight learning
(D) Latent learning

36. In which of the following is the current state of biology more of promises than realized major contributions?
(A) Food production by GMO and genetic engineering
(B) Pest control and understanding about diseases
(C) Food production and population control
(D) Understanding of health and biodiversity conservation

37. Which of these elements is known to have less than 10% occurrence in many cells?
(A) Carbon (B) Hydrogen (C) Nitrogen (D) Oxygen

38. One of the following is a non-carbohydrate molecule.
(A) Starch (B) Cellulose (C) Glycogen (D) Collagen

39. The industrial use of enzymes is helpful for the environment as it contributes to reduction of CO_2 emission. In which of the following is there more mass of CO_2 emissions saved per ton of products by using enzyme technology rather than traditional methods?
(A) Bread making
(B) Manufacture of cosmetics
(C) Paper making
(D) Cheese making

40. Which model of enzyme action requires that the shape of the substrate molecule is complementary to that of the active site?
(A) The induced-fit model
(B) The lock-and-key model
(C) The activation energy model
(D) The enzyme function model

41. If the average diameter of the human red blood cell is 0.000007 m, which one is its correct diameter when expressed in a smaller unit?
(A) 0.00007μm (B) 0.007 μm (C) 7 mm (D) 7000 nm

42. Which procedure allows biologists to separate different cellular organelles and study their structures and compositions separately?
(A) Dehydrogenation
(B) Cell fractionation
(C) Phosphorylation
(D) Polymerization

43. How many ATP molecules are produced during the complete cellular respiration of one glucose molecule?
(A) 2 (B) 4 (C) 18 (D) 36

44. What is the main method of transmission of botulism?
(A) Direct contact
(B) Droplet infection
(C) Eating contaminated food
(D) Drinking contaminated water

45. From which group of microorganisms was the first antibiotics produced?
(A) Members of viruses
(B) Members of the fungi
(C) Gram-negative bacteria
(D) Gram-positive bacteria

46. What is a capsid?
(A) The genetic material of a virus
(B) The DNA of a virus
(C) The RNA of a virus
(D) The protein shell of a virus

47. What is the general name of crop plants that add nitrogen to the soil because of their symbiotic association with certain types of bacteria?
(A) Nodules (B) Legumes (C) Cereals (D) Herbs

48. If two parents with genotypes 'Aa' are cross-bred and that there is no codominance in the inheritance pattern, what proportion of the offspring would have genotypes exactly like that of their parents?
(A) 50% (B) 75% (C) 100% (D) 25%

49. Which of the following is an example of a cell formed by reduction division?
(A) Nerve cells
(B) Kidney cells
(C) Bone cells
(D) Sperm cells

50. One of the following sources of evidence provides a more direct support to the process of Charles Darwin's theory of evolution.
(A) Physiology
(B) Anatomy
(C) Genetics
(D) Geographical distribution

51. Which animal behaviour pattern is best illustrated by the famous Pavlov's dog?
(A) Associative learning
(B) Latent learning
(C) Instinctive behaviour
(D) Habituation

52. Through which of the following methods can blood be separated into its cellular and fluid parts?
(A) Separating funnel
(B) Fractional distillation
(C) Centrifuging
(D) Simple distillation

53. The most abundant inorganic molecule in the atmosphere that traps heat is:
(A) H_2S (B) O_2 (C) H_2O (D) CO_2

54. When glucose molecules are joined by α-linkage which of the following carbohydrate is obtained ?
(A) lactose (B) starch (C) glycogen (D) cellulose

55. Which of the following statements is **NOT** correct about the effect of temperature on enzymes.
(A) Raising the temperature increases the kinetic energy of molecules.
(B) A ten degree centigrade increase in temperature may increase the activity of most enzymes by 50% to 100%.
(C) Most enzymes are insensitive to temperature at low pH.
(D) Most enzymes are denatured at 40 Degree Centigrade.

56. Organelles in the cytoplasm that are known as 'power house' of the cell are:
(A) mitochondria (C) ribosome
(B) chloroplast (D) cellulose

57. Which of the following is **NOT** a function of lysosomes?
(A) Autophagy (C) Digestion
(B) Autolysis (D) Synthesis

58. The different steps for complete aerobic respiration are:
(A) Glycolysis and oxidative phosphorylation.
(B) Glycolysis and Krebs cycle.
(C) Glycolysis, Krebs cycle and terminal oxidation.
(D) Krebs cycle and terminal oxidation.

59. Which of the following processes indicate the process of photosynthesis?
(A) Reductive, exergonic and catabolic
(B) Reductive, endogenic and catabolic
(C) Reductive, exergonic and anabolic
(D) Reductive, endergonic and anabolic

60. The active sludge method of Sewage treatment is based on the principle of
(A) decomposition and removal of organic matter.
(B) removal of polluting organic matter through filtration.
(C) denitrification.
(D) anaerobic respiration.

61. When an organism containing a gene which does **NOT** belong to it and is derived from Somewhere else, the organism is said to be:
(A) hybrid. (C) mutant.
(B) transgenic. (D) clonal.

62. When is reverse transcriptase a useful enzyme? When:
(A) nutrients are scarce.
(B) there are no host cells present
(C) spikes are forming in the new virus.
(D) an RNA virus converts its RNA to DNA.

63. If you were to travel from the Arctic Circle to the Equator, what sequence of biomes would you most likely pass through?
(A) Tundra, temperate forest, taiga, tropical rain forest
(B) Taiga, tundra, temperate forest, tropical rain forest
(C) Tundra, taiga, temperate forest, tropical rain forest
(D) Tropical rain forest, temperate forest, taiga, tundra

64. The fact that Ethiopia is a regional center of biological diversity which of the following diversity is expressed?
(A) The many mountain, valleys, rivers and scenic beauty.
(B) High number of endemic wild and domestic plant species.
(C) Wide range of altitude and climate.
(D) The number of different biomes in the country.

65. Under ideal conditions and unlimited resources, continuous population growth pattern is known as:
(A) density dependent growth
(B) logistic growth
(C) exponential growth
(D) population distribution growth

66. If colour blindness is sex linked and a colour-blind man marries the daughter of a colour-blind person, which of the following is their progeny?
(A) None of her daughters are colour-blind
(B) All her sons are colour-blind
(C) All her daughters are colour-blind
(D) Half of her sons are colour-blind

67. Transfer of a gene or genes through a virus is called:
(A) transformation
(B) transduction
(C) genetic engineering
(D) conjugation

68. Which of the following concept is attributed to Charles Darwin?
(A) Use and disuse of organs is of great importance in evolution.
(B) Every cell must come from a pre-existing cell.
(C) In the struggle for existence, the fittest would survive.
(D) The gametes will carry only one of a pair of contrasting characters.

69. Occurrence of endemic species in Ethiopia is due to:
(A) the fact that these species have been extinct from other regions.
(B) continental separation.
(C) the fact that there is no terrestrial route to these places.
(D) retrogressive evolution.

70. "Skinner box" is used for experiments in:
(A) operant conditioning
(B) classical conditioning
(C) migration
(D) taxis

71. Which of the following factors affects enzyme activity without denaturing the enzyme molecule?
(A) High temperature
(B) Low temperature
(C) High pH
(D) Low pH

72. Which of the following can reverse or reduce an allosteric enzyme inhibition?
(A) Adding more substrate
(B) Adding more end products
(C) Depleting the substrate
(D) Depleting the end product

73. In what way do retro viruses differ from the other RNA viruses?
(A)Their genetic material is RNA.
(B)They are parasitic.
(C) They copy RNA to DNA.
(D) They are smaller in size.

74. As an ecological succession passes from a lower to a higher seral stage, which of the following will **NOT** happen?
(A) The community gets more complex
(B) Ecological niches increase
(C) Species get more diverse
(D) Soil nutrient is depleted

75. What is the population growth phase of the current world population?
(A) Exponential phase
(B) Lag phase
(C) Decline phase
(D) Static phase

76. If allowed to self-pollinate, which of the following pea genotype would produce progeny with 9 : 3 : 3 : 1 phenotypic ratio?
(A)RRYy (B) RrYY (C) RRYY (D) RrYy

77. How many nucleotides are needed to form codons for a protein that is 100 amino acids long?
(A)100 nucleotides
(B)200 nucleotides
(C) 300 nucleotides
(D) 640 nucleotides

78. Which of the following is the common idea held by all the creationists?
(A) Life is eternal.
(B) Life was created by a supernatural being.
(C) All life was created in six days.
(D) Life came to earth from elsewhere in the universe.

79. Among the following, which one had the cranial capacity of about the same size as that Of *Homo sapiens*?
(A) *Homo habilis*
(B) *Homo erectus*
(C) Lucy
(D) The Neanderthal man

80. One of the following behavioral pattern of human babies is more or less similar to the imprinting of newly hatched goose?
(A) Fixed action pattern
(B) Attachment-formation
(C) Habituation
(D) Breast suckling

81. In the human body, which conditions are generally considered optimum for most enzymes?
(A) 37^0C and pH 1.0
(B) 90^0C and pH 7.0
(C) 5^0C and pH 9.0
(D) 37^0C and pH 7.0

82. Which of the following has the highest water potential than all the other?
(A) Animal cells
(B) Different solutions
(C) Pure liquid water
(D) Different suspensions

83. Which of the four stages in the aerobic respiration of glucose does **NOT** produce ATP?
(A) Glycolysis
(B) The link reaction
(C) Krebs cycle
(D) Electron transport & chemiosmosis

84. In an experiment to study photosynthesis, a plant was provided with radioactive carbon dioxide as a metabolic tracer and the radioactive carbon was incorporated first into oxaloacetate. Which one of the following would best characterize this plant?
(A) C4 plant
(B) C3 plant
(C) CAM plant
(D) Heterotrophic plant

85. Which of the following is a correct statement about the difference between a bacterium and a virus?
(A) DNA is present in the former, but absent in the latter.
(B) The former is cellular, but the latter is a cellular.
(C) Protein is absent in the former, but present in the latter.
(D) The former causes malaria, but the latter causes cholera.

86. Which of the following statements about transgenic organisms is correct?
(A) A bacterium that contains genes from another organism.
(B) A plant that has been cross-pollinated with another plant.
(C) An animal that has been reared in isolation in the laboratory.
(D) Any organism in which a foreign gene is added to its genome.

87. If a radioactive substance that weighs 5,600 grams and has a half-life of 100 years is left with 700 grams, for how long has the decaying activity been undergoing?
(A) 100 years
(B) 200 years
(C) 300 years
(D) 500 years

88. What is the survival value of a social behaviour in which some birds move in large groups?
(A) Protection of a territory
(B) Protection from predators
(C) Technique for trapping prey
(D) Displaying courtship activities

89. What is the biome of the world where succulent plants are commonly found?
(A) Hot deserts
(B) Thorn forests
(C) Deciduous forests
(D) Temperate grasslands

90. Which of the following statements is **NOT** correct?
(A) Employers may not dismiss an employee because of his/her HIV status.
(B) HIV-positive people are forced by law to disclose their HIV status.
(C) There is no medication that can reduce your chances of contracting HIV.
(D) Mothers can give their babies HIV by means of breastfeeding.

91. Lipids to become sphingolipids must contain:
(A) Glycerol
(B) Nitrogen
(C) Alcohol
(D) Triglycerides

92. If other conditions were to remain constant, which one of the following changes would explain a reduced rate of activity in an enzyme-controlled reaction? Increase in
(A) concentration of end-product.
(B) substrate concentration.
(C) enzyme concentration.
(D) temperature towards the optimum.

93. Which of the following statements best describes an induced fit-model?
(A) an active site alters shape such that it is ready to accept a substrate.
(B) a substrate adopts the correct binding conformation before entering an active site.
(C) a substrate binds to an active site and alters the shape of the active site.
(D) an active site alters the shape of the substrate such that it can adopt the necessary active conformation for binding.

94. Which of the following happens if a nucleolus is missing in a cell?
(A) Nuclear pores will be blocked
(B) Endoplasmic reticulum will be unfolded
(C) DNA synthesis will be enhanced
(D) Ribosomal functions will be disrupted

95. Which one is first inhibited if a cell contains excess of ATP?
(A) Krebs cycle
(B) Oxidative phosphorylation
(C) Glycolysis
(D) Electron transport

96. Which of the following results in the production of oxygen during photosynthesis?
(A) Reducing NADP+
(B) Splitting of the water molecules
(C) Electron transfer system of photosystem I
(D) Electron transfer system of photosystem II

97. Which one of the following happens during integration of viruses in host cells?
(A) The virus takes over the host cell machinery.
(B) The viral DNA enters the host cell.
(C) The virus attaches to a host cell repector.
(D) The viral DNA is inserted into the host DNA.

98. The following statements are correct regarding ecological succession **EXCEPT:**
(A) Ecological succession is a random process.
(B) The food chain relationship becomes more complex.
(C) The role of decomposers becomes more and more important.
(D) Species diversity increases as succession proceeds

99. Which one of the following phenomena supports Darwin's concept of natural selection in organic evolution?
(A) Development of transgenic animals
(B) Production of 'Dolly', the sheep by cloning
(C) Prevalence of pesticide resistant insects
(D) Development of organs from 'stem cells' for organ transplantation

100. One of the following is **NOT** true about operant conditioning.
(A) It is based on innate behaviors.
(B) It is based on reward and punishment.
(C) It is concerned with learnt behavior.
(D) It is based on consequences of actions.

THE END

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