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ETHIOPIAN UNIVERSITY ENTRANCE EXAMINATION (EUEE)  
BIOLOGY EXAMINTION 2007

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TIME ALLOWED: 00

**1. Which of the following units of measurement is more convenient to express the size of cellular organelles?**

- A) Meter
- B) Centimeter
- C) Milliliter
- D) Micrometer

**2. Which of the following step of the scientific method comes before all the rest?**

- A) Hypothesis
- B) Experiment
- C) Conclusion
- D) Reporting the result

**3. What do we call a scientists who specializes in studying insects?**

- A) An ecologist
- B) A paleontologist
- C) An entomologist
- D) a microbiologist

**4. To which one of the following organic molecules do enzymes belong?**

- A) Carbohydrate
- B) Amino acids
- C) Proteins
- D) Lipids

**5. Which of the following is a coenzyme**

- A) NAD
- B) Carbohydrate

- C) Water molecule
- D) Proteins

**6. Which of the following behavioral biologists is known for his study about imprinting behavior in animals?**

- A) W. Kohler
- B) B.F. Skinner
- C) Ivan pavlov
- D) Konrad Lorenz

**7. Which tool of the biologist is more frequently used to study cell structure in the laboratory**

- A) Dissecting kit
- B) Centrifuge
- C) Petri-dish
- D) Microscope

**8. What colour do gram-positive bacteria stain with Gram's stain?**

- A) Red
- B) Pink
- C) Purple
- D) White

**9. Which group of organisms in the ecosystem release nutrients locked up in dead bodies of organisms?**

- A) Parasites
- B) Decomposers
- C) Autotrophs
- D) Carnivores

**10. Which of the following are the two major constituents of eukaryotic chromosomes?**

- A) DNA and RNA
- B) DNA and protein
- C) DNA and carbohydrate
- D) RNA and lipid

**11. Which one of the following crops has its center of origin and diversity in Ethiopia has become a leading international commodity of commerce?**

- A) Teff
- B) Enset
- C) Coffee
- D) Anchote

**12. Which group of animal has the highest number of total and endemic species in Ethiopia ?**

- A) Amphibians

- B) Birds
- C) Mammals
- D) Reptiles

**13. What is the molecule that supplies the quickest and suitable source of energy to cells?**

- A) Lactose
- B) Sucrose
- C) ATP
- D) Lipid

**14. A carbohydrate compound is known to have 12 carbon atoms in the whole molecule. What could this compound be?**

- A) A polypeptid
- B) A disaccharide
- C) A monosaccharide
- D) A polysaccharide

**15. Among the following organisms, which one belongs to the prokaryotes?**

- A) Paramecium
- B) Streptococcus
- C) Spirogyra
- D) Tapeworm

**16. Which of the following is consistent with the understanding of human evolution?**

- A) Bipedalism was never important in human evolution.
- B) Larger brain size had no contribute to the evolution of the human species.
- C) Human ancestry hand no relation whatsoever with that of the chimpanzees
- D) Fossils of Lucy and Ardi provided evidence for human origin.

**17. Baby ostriches tend to follow the first moving object that they see as they hatch out of the eggs. What kind of animal behaviour does this demonstrate?**

- A) Positive taxis
- B) Innate behavior
- C) Positive kinesis
- D) Learned behavior

**18. Which of the following true about mutations that occur in normal body cells?**

- A) They never lead to cancerous cells.
- B) They never pass to the next generation
- C) They never damage the affected cells.
- D) There is no way that they kill the affected cells.

**19. What is the processes called when two bacteria directly contact cell to cell and exchange their genetic information?**

- A) Conjugation
- B) Transformation
- C) Co-transformation
- D) transduction

**20. Why is it that mutations are considered as one of the raw materials of evolution?**

- A) They contribute to new variations in organism
- B) They are usually related to the environment in which they appear.
- C) They are mostly beneficial to the organism in which they appear.
- D) They usually become the causes for species extinction

**21. Which of the following is formulated as a possible outcome of an experiment?**

- A) Hypothesis
- B) Prediction
- C) Data analysis
- D) Recording the data

**22. If certain food stuff gave a positive result with benedicts test only after it was hydrolysed with hydrochloric acid, which of the following substances could it be?**

- A) Non-reducing sugar
- B) Nucleic acid
- C) Lipid
- D) Proteins

**23. In scientific method, what is the importance of a background research for a given problem?**

- A) To formulate a hypothesis
- B) To make a prediction
- C) To prepare report of the result
- D) To make a conclusion

**24. Which of the following is NOT true about mitochondria and chloroplasts?**

- A) Both contain chlorophyll
- B) Both contain nucleic acid
- C) Both have double membrane
- D) Both transduce energy

**25. Which of the following molecules is NOT a polymer?**

- A) Protein
- B) Lipid

- C) RNA
- D) Starch

**26. What does it mean when biologists express the cell membrane as a unit membrane?**

- A) A cell is covered by a single membrane.
- B) A membrane is only one lipid layer thick
- C) All cells have essentially similar membrane.
- D) A membrane is covered by a single layer of protein.

**27. Which of the following classes of molecule CANNOT pass easily across the cell membrane by simple diffusion?**

- A) Small non-polar molecules
- B) Lipid soluble molecules
- C) Non-polar molecules
- D) polar molecules

**28. Which of the following substance has a shape which is similar to that of the substrate of an enzyme?**

- A) The reaction product
- B) A competitive inhibitor
- C) A cofactor
- D) An allosteric inhibitor

**29. At which level of structural organization do proteins have the alpha helix shape?**

- A) Primary structure
- B) Secondary structure
- C) Tertiary structure
- D) Quaternary structure

**30. Among the following scientists who contributed to the cell theory, identify the one who stated that a cell can arise only from another cell like it.**

- A) Robert Hooke
- B) Theodor Schwann
- C) Matthias Schleiden
- D) Rudolf virchow

**31. Which of the following modes of transport is used by cell to move substance against their concentration gradients?**

- A) Osmosis
- B) Simple diffusion
- C) Facilitated diffusion
- D) Active transport

**32. Which of the following features makes human T-lymphocyte cells more vulnerable to HIV attack?**

**Presence of:**

- A) Cell membrane.
- B) DNA on the chromosomes.
- C) CD4 on the membrane surface
- D) Pores in the cell membrane

**33. Which one of the following terms refers to how fast an enzyme acts on its substrate?**

- A) Turn over number
- B) Substrate number
- C) Enzyme number
- D) Product number

**34. Which of the following factor determines the rate at which organelle settle out of cell homogenate if spun in a centrifuge?**

- A) Mass of the organelle
- B) Function of the organelle in the cell.
- C) Location of the organelle in the cell
- D) Thickness of the membrane covering the organelle

**35. Which one of the following classes of organic molecule is the least important source of energy for cellular respiration?**

- A) Nucleic acids
- B) Lipids
- C) Carbohydrates
- D) Proteins

**36. Which one of the following processes has a decreasing effect on the concentration of atmospheric carbon dioxide?**

- A) Cellular respiration
- B) Combustion of fossil fuels
- C) Decomposition of dead organism
- D) Photosynthesis

**37. Which of the following is NOT true about instinctive behaviour?**

- A) It can be developed further through learning
- B) It is triggered by a key stimulus
- C) It has a fixed action pattern.
- D) It is adaptive for the species

**38. In which of the following ways do retroviruses differ from other RNA viruses?**

- A) Their genetic materials is DNA.

- B) Their genetic materials is RNA.
- C) They copy RNA to DNA molecule
- D) They copy RNA from DNA molecule

**39. Which of the following group of micro-organisms does not contain parasitic members?**

- A) Bacteria
- B) Algae
- C) Fungi
- D) protozoa

**40. Which of the following is NOT the correct characteristics of tropical rainforests?**

- A) Low biodiversity
- B) High temperature
- C) Heavy precipitation
- D) trees of different heights

**41. From evolutionary point of view, which of the following animals is expected to have haemoglobin proteins that are least similar to that of human?**

- A) Ape
- B) Cow
- C) Chicken
- D) Frog

**42. For what purpose do molecular biologists use the technology known as polymerase chain reaction or PCR?**

- A) To insert DNA in to plasmids.
- B) To insert plasmids in to bacteria.
- C) To multiply copies of DNA molecule.
- D) To produce DNA from RNA.

**43. What is the long term primary effect of the current tree planting activities that Ethiopia is undertaking ?**

- A) It will protect from harmful solar rays.
- B) It will increase the global temperature.
- C) It will reduce the atmospheric CO<sub>2</sub>.
- D) It will mend the holes in the ozone layer.

**44. Suppose when you first enter a room you notice an unpleasant smell which you eventually forget about its presence, what is this behaviour called?**

- A) Latent learning
- B) Insight learning
- C) Habituation
- D) Operant conditioning

**45. Which of the following is an evolutionary requirement for two sub-populations of species to evolve in to independent species?**

- A) Free exchange of genes
- B) Geographic isolation
- C) Free migration between populations
- D) Absence of natural selection

**46. What does a restriction enzyme do?**

- A) Restricts transcription
- B) Cuts DNA at specific sites
- C) Prevents DNA from replicating
- D) Hydrolyses the DNA molecule

**47. Which element is found in nucleic acids?**

- A) Calcium
- B) Iron
- C) Magnesium
- D) phosphorus

**48. From where do plants get most of their nutrients?**

- A) Chlorophyll
- B) Soil
- C) Light
- D) Atmosphere

**49. What do you call a group of genetically identical plants produced by vegetative reproduction?**

- A) Family
- B) Clone
- C) Hybrid
- D) Genus

**50. What is the base found in RNA in place of thymine of DNA ?**

- A) Cytosine
- B) Guanine
- C) Thymine
- D) Uracil

**51. The most complex structure of proteins is called**

- A) Primary structure
- B) Secondary structure
- C) Tertiary structure

- D) Quaternary structure

**52. Which one of the following is the smallest of all?**

- A) A red blood cell  
 B) A virus  
 C) A bacterium  
 D) An amoeba

**53. What is the ultimate source of all scientific knowledge?**

- A) Observation  
 B) Guessing  
 C) Trial and error  
 D) Observation and experimentation

**54. The optimum temperature of enzymes found in thermophilic bacteria is:**

- A) Lower than for enzymes in the human body.  
 B) Higher than for enzymes in the human body.  
 C) The same as enzymes found in human body.  
 D) Lower than enzymes found in warm blooded animals.

**55. A cow was found to yield much higher than any of the breeds of the parental cattle. What could be the most probable reason for this ?**

- A) Dominant genes  
 B) Hybrid vigour  
 C) Recessive genes  
 D) Co-dominance genes

**56. In the formation of a macromolecule, what type of reaction would join two subunits together?**

- A) Hydrolysis reaction  
 B) Dehydration reaction  
 C) Denturaiton reaction  
 D) Hydrophobic reaction

**57. Which are the four most abundant elements in living cells?**

- A) Carbon, oxygen, sulphur, phosphorus.  
 B) Carbon, oxygen, hydrogen, nitrogen.  
 C) Carbon, oxygen, nitrogen, sulphur.  
 D) Carbon, oxygen, sulphur, magnesium

**58. When the F1 hybrid of a monohybrid cross is back crossed with the homozygous recessive parent, what percentage of the offspring would be homozygous recessive?**

- A) 0 %

- B) 25 %
- C) 50 %
- D) 75 %

**59. which of the following is an inorganic molecule?**

- A)  $\text{CaCO}_3$
- B)  $\text{CH}_4$
- C)  $\text{C}_6\text{H}_{22}\text{O}_{11}$
- D)  $\text{C}_{18}\text{H}_{36}\text{O}_2$

**60. Which of the following expression is more related to the phase "survival of the fittest"?**

- A) Natural selection
- B) Mendelian inheritance
- C) Gene mutation
- D) Inheritance of acquired characteristics

**61. To which group of organic compounds do the triglycerides and waxes belong?**

- A) Carbohydrate
- B) Proteins
- C) Lipids
- D) Vitamins

**62. What did Francesco Redi prove through his scientific experiment?**

- A) Maggots appear spontaneously on foods placed anywhere.
- B) Maggots do not appear in foods kept in jars that are protected with a cover.
- C) Maggots do not appear in foods kept in open jars
- D) flies appear spontaneously on rotting meat kept in closed or open jars alike.

**63. Which one of the following shows the feeding methods of decomposers?**

- A) Saprobiotic nutrition
- B) Autotrophic nutrition
- C) Parasitic nutrition
- D) Intracellular digestion

**64. What happens when the carrying capacity of an ecosystem is reached?**

- A) Excretory product accumulates and population numbers increase.
- B) Population numbers decline rapidly.
- C) Population numbers remain more or less constant.
- D) Resources are plentiful and populations shoot up

**65. In which industrial products is pyruvate fermentation by yeast practically applied?**

- A) Brewing beer

- B) Swiss cheese making
- C) Production of vinegar
- D) Yoghurt making

**66. If a substance that weighs 2000 grams and has a half-life of 100 years is left with only 250 grams, for how long has the radioactive decaying activity been undergoing?**

- A) 200 years
- B) 250 years
- C) 300 years
- D) 500 years

**67. What does an ethnologist study?**

- A) Insect diets
- B) Soil types
- C) Fossil fuel
- D) Animal behavior

**68. Which one of the following is a biotic factor operating within an ecosystem?**

- A) The amount of helium gas in the air
- B) The rate of flow of water in a river
- C) The carnivores that consume other animals
- D) The type of climate in a given region

**69. When athletes take part in short distance running, how do the cells generate most of the energy that is quickly needed?**

- A) Aerobic respiration in muscle cells
- B) Mitochondrial respiration in any cells
- C) Anaerobic respiration in muscle cells
- D) Yeast fermentation in the stomach.

**70. What do you call the reasoning technique in science where general principle are used to analyse specific cases?**

- A) Induction
- B) Deduction
- C) Pseudo-deduction
- D) Pseudo-induction

**71. If the rate of an enzyme catalysed reaction remains constant even when more substrate is added to the reaction, which of the following might be the reason?**

- A) Saturation of the enzyme
- B) Inactivation of the enzyme
- C) Inhibition of enzyme-substrate complex formation

D) Loss of substrate specificity by the enzyme

**72. Which of the following will primarily happen if the enzymes in the lysosomes of a cell are defective?**

- A) Cellular debris will not be removed
- B) Chromosome replication will cease
- C) ATP production will stop
- D) Diffusion process will stop

**73. Which of the following is true about all proteins?**

- A) They are twenty amino acids long
- B) They are globular in shape
- C) They perform the same function
- D) The monomers are held together by peptide bonds

**74. Which of the properties of water allows mosquito larvae to hang themselves down in to the water from the water surface?**

- A) Its high specific heat capacity
- B) Its high latent heat of vaporization
- C) Its high surface tension
- D) Its low density in solid state

**75. Which of the following properties of enzymes makes it possible that a single enzyme molecule can act on many substrate molecules?**

- A) Enzymes are proteins
- B) Enzymes lower the energy of activation
- C) Enzymes are reused over and over again
- D) Enzymes are substrate specific

**76. The T-lymphocyte cells of AIDS patients are destroyed by:**

- A) Multiplication of HIV inside the cell
- B) Infection of opportunistic organisms
- C) The immune system of the host organism itself
- D) The CD<sub>4</sub> receptors on the cell surface

**77. Which stage in the life cycle of HIV is disrupted if AIDS patients are treated with a drug that has protease inhibiting activity?**

- A) Entry of the virus in to the host
- B) Conversion of viral RNA to DNA.
- C) Integration of viral DNA into host DNA.
- D) Assembly of viral parts in to whole virus

**78. Of the following four cells whose surface area to volume ratio is given which cell can more efficiently transport its needs of materials across the cell surface?**

- A) 24:8 ratio
- B) 54:27 ratio
- C) 96:64 ratio
- D) 150:125 ratio

**79. Cells immediately use the energy that electrons lose as they pass along the chain of electron carriers to:**

- A) Produce ATP
- B) Pump protons
- C) Spin the rotor of ATP synthase
- D) reduce NAD

**80. Which of the following is a routine method used by clinics to test people for HIV infection?**

- A) Microscopic examination for the virus
- B) Counting the number of white blood cells
- C) Testing for human anti-HIV antibody
- D) Measuring the amount of haemoglobin

**81. Which of the following is NOT true about the nature of the first form of organisms on earth? They were**

- A) Prokaryotic
- B) Unicellular
- C) aerobic
- D) anaerobic

**82. Suppose a fossil initially contains 100,000 atoms of a certain radioactive element whose half-life is 10,000 years, after how many years would the number of the atoms be 12500?**

- A) Ten thousand years
- B) Twenty thousand years
- C) Thirty thousand years
- D) Forty thousand years

**83. The following are Simpson's Index of species diversity calculated for four areas containing the same types of species. Which index value is from the area dominated relatively by a fewer number of species?**

- A) 8.00
- B) 6.00
- C) 3.5
- D) 2.5

**84. which of the following happens in both cyclic and non-cyclic photophosphorylation?**

- A) ATP is formed
- B) Oxygen is generated
- C) NADP is reduced
- D) water molecule splits

**85. Which of the following is NOT a true characteristic of the populations of most of the developing countries of the world?**

- A) High fertility rate
- B) Increasing population size
- C) More number of old people than young people
- D) Birth rate greater than mortality rate

**86. Which of the following come first in the course of organic evolution?**

- A) Photosynthetic organisms
- B) Free oxygen in the atmosphere
- C) Land plants
- D) Multicellular organisms

**87. Choose the step that comes at the last step in the scientific method.**

- A) Proposing the research hypothesis
- B) Formulation of a scientific theory
- C) Conducting experiments
- D) Making predictions

**88. Which of the following is NOT true about C<sub>4</sub> plants such as tef (Eragrostis tef)?**

- A) CO<sub>2</sub> is harvested during the night time.
- B) The bundle sheath cells contain chloroplasts.
- C) Light -dependent reaction occurs in mesophyll cell.
- D) Chloroplasts of bundle sheath cells lack thylakoids.

**89. What is the reason that plants do not use nitrogen directly from the atmosphere?**

- A) Nitrogen concentration is low in the atmosphere.
- B) The molecular size of nitrogen is too large to pass through the stomata.
- C) Nitrogen can enter plants only through the root hairs.
- D) Plants lack the necessary process to use elementary nitrogen.

**90. What does the fermentation of glucose by yeast normally yield?**

- A) Lactic acid, CO<sub>2</sub>, and 2 ATP
- B) CO<sub>2</sub>, H<sub>2</sub>O, and 36 ATP
- C) Alcohol, CO<sub>2</sub>, and 2 ATP
- D) Alcohol, CO<sub>2</sub>, and 36 ATP

**91. Which hormone promotes human sleepfulness in darkness and controls the sleep-wake cycle?**

- A) Insulin
- B) Adrenaline
- C) Melatonin

D) Thyroxin

**92. Which two nitrogenous bases belong to the purines?**

- A) Adenine and thymine
- B) Adenine and guanine
- C) Guanine and cytosine
- D) Thymine and uraci

**93. Which of the following is true ?**

- A) Recessive alleles are only expressed in the homozygote.
- B) Dominant alleles are expressed only in the heterozygote.
- C) Recessive alleles are expressed in the heterozygote.
- D) Genetically modified organisms are never used to manufacture vaccines

**94. Which of the following is a functional group of a fatty acid?**

- A) A ketone group
- B) An aldehyde group
- C) An amino group
- D) A carboxyl group

**95. Which one of the following is an example of an orientational innate behaviour?**

- A) Kinases in woodlice
- B) Blinking of the eyes
- C) Sudden withdrawal of limbs from hot object
- D) Nest building by weaver birds

**96. One of the following is true about bacteriophages that have lysogenic life cycle.**

- A) They are RNA viruses
- B) They integrate their nucleic acid in to that of the host
- C) They multiply in the host immediately after infection
- D) Progeny viruses are released by chronic release method

**97. In Pavlov's experiment on the classical conditioning of dogs ,what does the reaction of the dogs to the sound of the bell represent?**

- A) The conditioned stimulus
- B) The conditioned response
- C) The unconditioned stimulus
- D) The unconditioned response

**98. What is the purpose of the in folding of the inner -membrane of the mitochondrion?**

- A) Increasing the photosynthetic capacity of the cell.
- B) Speeding up the loss of CO<sub>2</sub> during fermentation.

- C) Speeding up the process of glycolysis
- D) Increasing the surface area for ATP production

**99. Which of the following is a worthwhile biological problem for scientific investigation ?**

- A) Estimation of the amount of carbon in a forest ecosystem
- B) How a crying dog can tell who among elders of the village is going to die next.
- C) How witchcrafts inflict bad health by cursing a healthy person
- D) How the traditional medicine men/women cure a possessed person

**100. Which of the following biomass of the earth has the greatest diversity of species?**

- A) Deciduous forest
- B) Tropical rain forest
- C) Desert
- D) Tundra

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