

**ADDIS ABABA CITY ADMINISTRATION EDUCATION
BUREAU
GRADE 12 BIOLOGY MODEL EXAMINATIONS
MESEKEREM 2015/ SEPTEMBER 2022**

NUMBER OF QUESTIONS: 100 TIME ALLOWED:-2 HOURS

GENERAL DIRECTIONS

THIS BOOKLET CONTAINS **BIOLOGY** EXAMINATION. 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 FROM YOUR ANSWER SHEET.

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 FURTHER 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.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

1. Suppose you have submitted a laboratory report for your teacher. The teacher returned it back saying that you didn't properly explain the cause and effect relationships in your particular topic in the report. In which section of the report should you include this information?
 - A. Introduction
 - B. Conclusion
 - C. Results
 - D. Discussion
2. Which one of the following is used as an input to formulate a hypothesis about the particular observed problem?
 - A. Testing the educated guess
 - B. Gathering information from scientific magazine
 - C. Collecting evidence through experiment
 - D. Making prediction
3. Identify the biological tool that used by ecologist to measure the distribution and abundance of slowly moving or non-moving organisms in the given ecological area?
 - A. Plant press
 - B. Quadrant
 - C. Theodolite
 - D. Pitfall trap
4. Which discipline of biology concerned with collection, storage, and analysis of biological data, mainly DNA and protein sequences?
 - A. Biotechnology
 - B. Molecular biology
 - C. Bioinformatics
 - D. Cell biology
5. Which tools of biologist is more suitable for monitoring growing conditions in the agricultural industry?
 - A. Theodolite
 - B. Microscopes
 - C. Petri dishes
 - D. Data logger
6. Biology attempts to reclaim waste land through the use of microorganisms and plants that remove and degrade toxic compounds. To which major area this relevance and application of biology is most related?
 - A. Environment
 - B. Agriculture
 - C. Biotechnology
 - D. Medicine
7. Biological knowledge is relevant in Ethiopia to address all of the following issues **EXCEPT**?
 - A. Environmental well-being
 - B. Conservation of biodiversity
 - C. Control of over population growth
 - D. To minimize security problem

8. Biologists have been striving to produce a vaccine against HIV based on the study of:
- A. some strains of HIV and its life cycle
 - B. a weakened form of HIV itself and herd immunity
 - C. the infection mechanism of HIV and immune responses to it
 - D. a group of people who have been repeatedly exposed to HIV but never developed AIDS
9. A grade 12 student hypothesized that high concentration of copper dissolved in the water in the soil seriously affects the growth rate of plants. To test his hypothesis, he assigned plants as group “A” and group “B”. Group “A” plants were given different concentration of copper and group “B” plants were given moderate amount of copper. Each group has the same amount of soil, water, temperature and number of seeds. In this experiment, the number of seeds assigned in the experimental group is:
- A. dependent variable
 - B. controlled variable
 - C. confounding variable
 - D. manipulated variable
10. Why organisms store energy in the form of polysaccharides instead of monosaccharides? This is because:
- A. they have lower osmotic pressure
 - B. they are soluble in water
 - C. they are quickly hydrolyzed by enzymes
 - D. they are branched molecule
11. Which chemical element is frequently found in living organisms with high percentage as compared to others?
- A. Oxygen
 - B. Carbon
 - C. Hydrogen
 - D. Nitrogen
12. What are the factors that determine the extraordinary and unique properties of water that make it suitable for life?
- A. The polar covalent bond between oxygen and hydrogen atoms
 - B. The hydrogen bond between water molecules
 - C. Its small size and polarity
 - D. Its V-shaped structure and dipole properties

13. Which characteristics of carbohydrates distinguish them from protein and lipids?
- A. They have carbon, hydrogen and oxygen
 - B. They are the main component of cell membrane
 - C. They possess a free aldehyde or ketone group
 - D. They possess less oxygen than lipids and proteins
14. When 100 amino acids joined together through condensation reaction, how many peptide bonds are formed and water molecules are released respectively?
- A. 99, 99
 - B. 50, 50
 - C. 99, 98
 - D. 100, 99
15. When glucose and galactose molecules are joined together by glycosidic bond through condensation reaction, the expected molecular formula of the disaccharide will be:
- A. $C_{12}H_{12}O_{12}$
 - B. $C_{12}H_{24}O_{12}$
 - C. $C_{12}H_{22}O_{11}$
 - D. $C_{12}H_{22}O_{12}$
16. Which property of water helps to it to move through the xylem vascular bundle of plants during Passive transport system?
- A. Ideal viscosity, cohesive and adhesive behavior
 - B. High surface tension and viscosity
 - C. High latent heat of vaporization and universal solvent
 - D. Density of water and high specific heat capacity
17. A food gives a positive result when tested with the Emulsion test, and an initial negative result when tested with Benedict's solution. Following acid hydrolysis and neutralization, the food gave a negative test with Benedict's solution. The food contains:
- A. lipid and a non-reducing sugar
 - B. lipid, a reducing sugar and a non-reducing sugar
 - C. lipid and a reducing sugar
 - D. lipid only

- 18.If AIDS patients are given antiretroviral drugs that are targeted against the integrase enzyme, which one of the following stages of HIV life cycle would be inhibited?
- A. Membrane fusion and entry stage
 - B. Assembly of new viral particles
 - C. Transcription and translation process
 - D. Incorporation of viral DNA to host DNA
- 19.Why several different enzymes are involved to catalyze the metabolic system of human. This is because:
- A. enzymes are specific in their action
 - B. enzymes are effective in small amount
 - C. Small amount of enzymes can't bring change on large substrate
 - D. they are used up during chemical reaction
- 20.Esters of fatty acids with long chain monohydric alcohol, found on the feather of birds and the fur of some animals which serve as a water repellent is refers to:
- A. Oils
 - B. Phospholipid
 - C. Fat
 - D. Waxes
- 21.Which one of the following is the functional role of co-enzymes?
- A. Protect the enzyme from heat denaturation
 - B. Act as transporter of chemical groups from one reactant to another
 - C. prevents the enzyme from inhibitor substance
 - D. lowers the activation energy of the reaction
- 22.Cystic fibrosis is an inherited disease in which the body makes very thick, sticky mucus and results in breathing problems. Which enzyme is used to treat the person having this disease?
- A. Glucose oxidase
 - B. Lactase
 - C. Streptokinase
 - D. Pulmozyme
- 23.Which one of the following statements is best to describes the mechanism of enzyme catalysis? Enzymes function by
- A. changing the P^H of the reaction medium
 - B. forming an intermediate compound on their surface
 - C. increasing the kinetic energy of reactants
 - D. increasing the energy of activation

24. Why do biologists now prefer the induced-fit model over the lock and key model?
Because it explains:
- A. the regulation of enzyme activity
 - B. the specific properties of enzymes
 - C. the dynamic changes occurring at allosteric site
 - D. how apoenzymes and cofactors make complementary shape
25. In competitive inhibition, which one of the following factors determines the rate of inhibition?
- A. The reaction temperature
 - B. The enzyme temperature
 - C. The substrate concentration
 - D. The ratio of inhibitor to enzyme concentration
26. Which one of the following statements is best to describe the effect of P^H on the activity of enzymes?
- A. As P^H increases, the kinetic energy of substrate molecules will increase
 - B. High P^H changes the charge of amino acid in the allosteric site of enzymes
 - C. Significant P^H change results in denaturation of enzyme molecules
 - D. Enzymes work best beyond the optimum P^H range
27. Suppose a metabolic pathway consisting of five enzymes that are involved in the synthesis of the amino acid, isoleucine from amino acid, threonine. When a cell contains enough isoleucine, the synthesis is stopped by:
- A. the inhibition of the first enzyme in the pathway by the product isoleucine
 - B. reversing the direction of reaction until the isoleucine is optimized
 - C. removing the cofactors that bind with apoenzymes
 - D. the inhibition of the last enzyme in the pathway by threonine
28. Which one of the following human digestive enzymes works most effectively in acidic medium?
- A. Salivary amylase
 - B. Pepsin
 - C. Trypsin
 - D. pancreatic lipase
29. 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?
- A. Increase in concentration of end-product
 - B. Increase in substrate concentration.
 - C. Increase in enzyme concentration
 - D. Increase in temperature towards the optimum

30. Which enzyme has been named based on the reaction that it catalyses?
- A. Sucrase
 - B. Dehydrogenase
 - C. Pepsin
 - D. Papayin
31. In the development of cell biology, which event arises prior to others?
- A. The double-helix structure of DNA
 - B. The discovery of cell
 - C. The cell theory
 - D. Invention of microscope
32. According to the endosymbiont theory a large, anaerobic, heterotrophic prokaryote ingested a small, aerobic prokaryote, the aerobic endosymbiont has evolved into:
- A. chloroplast
 - B. nuclear envelope
 - C. endoplasmic reticulum
 - D. mitochondria
33. How does surface area to volume ratio limit cell size?
- A. The bigger cell gets, the less surface area to meet the demand of the cell's volume
 - B. As a cell decreases in size, the more difficulty taking in sufficient nutrients
 - C. The smaller cell gets, the large volume to carried out more metabolic activities
 - D. As a cell increases in size, the ability of a cell to exchange substances with its environment increases
34. Which one of the following is found in both prokaryotic and eukaryotic cells?
- A. chromosome associated with histone
 - B. Ribosome
 - C. Nuclear membrane
 - D. Mitochondrion
35. Suppose your teacher allowed you to separate one specific organelle from a sample of animal tissue, you have placed a sample of tissue in cold, isotonic buffer solution prior to centrifugation. What is the purpose of buffer solution?
- A. To reduce the activity of enzymes that breakdown organelles
 - B. To prevent water moving into organelles via osmosis
 - C. To prevent organelle proteins from becoming denatured
 - D. To prevent water moving into cells via osmosis

36. Which organelles work together in the production, packaging, and distribution of proteins?
- A. Ribosome, endoplasmic reticulum, lysosome and Golgi body
 - B. Chloroplast, endoplasmic reticulum, lysosome and nucleus
 - C. Golgi apparatus, peroxisome, ribosome and rough endoplasmic reticulum
 - D. Smooth endoplasmic reticulum, lysosome, ribosome and Golgi body
37. When physicians perform an organ transplant, they choose a donor whose tissues match those of the recipient as closely as possible. Which of the following cell components are being matched?
- A. plasma membrane phospholipids
 - B. plasma membrane proteins
 - C. cytoskeletal elements
 - D. cell-surface carbohydrates
38. Which one of the following transport systems is used as a mode of feeding mechanism for amoeba and protective mechanism of most animal cells?
- A. Pinocytosis
 - B. Phagocytosis
 - C. Receptor-mediated transport
 - D. Endocytosis
39. Identify the chemical component of cell membrane that functions as “temperature buffer,” stabilize the cell membrane at higher or lower temperature?
- A. Phospholipid
 - B. Protein
 - C. Cholesterol
 - D. Glycolipid
40. All of the following features are shared by both prokaryotic and eukaryotic cells **EXCEPT**?
- A. Acquire and utilize energy
 - B. Capable of synthesizing proteins
 - C. Possess genetic materials
 - D. Possess membrane bounded organelles
41. In eukaryotic cells like plants, where does the citric acid cycle take place?
- A. Chloroplast
 - B. Matrix of mitochondria
 - C. Cytoplasm
 - D. plasma membrane

42. Identify the correct statement regarding glycolysis metabolic pathway?
- A. Uses ATP to cleaved fructose 1,6-bisphosphate into triose sugars
 - B. Most of energy released from glucose is conserved in the form of NADH
 - C. Produce ATP without the use of oxygen
 - D. Results in 2CO_2 , and 2 pyruvate molecule from oxidation one glucose molecule
43. In which mechanism C4 and CAM plants minimize photorespiration and optimize Calvin cycle?
- A. In C4 plant, initial CO_2 fixation and the Calvin cycle separate in space while CAM plants separate them in time
 - B. In CAM plants, light dependent and Calvin cycle separate in place while C4 plants separate them in time
 - C. In C4 plants, light dependent and light independent reaction take place in bundle sheath while in CAM plants, they take place in mesophyll cell
 - D. In CAM plants, initial fixation of CO_2 and Calvin cycle take place in bundle sheath while in C4 plants, they take place in different cell
44. Why are carbohydrates and fats considered as high energy substrates for respiration?
- A. They have a lot of oxygen atoms
 - B. Have a lot of electrons associated with hydrogen.
 - C. They can have very long carbon skeletons
 - D. They are easily reduced
45. Which one of the following is the primary function of light dependent reaction of photosynthesis?
- A. Split water molecule and release oxygen
 - B. Regenerate ADP and NADP^+
 - C. Synthesize simple sugar from CO_2
 - D. Generate ATP and NADPH
46. Lactic acid fermentation is a metabolic process by which glucose is converted into cellular energy and metabolic lactate. When human aerobically respire, where is lactic acid converted back to pyruvic acid and then to glucose?
- A. Muscle
 - B. Liver
 - C. Mitochondria
 - D. Cytoplasm

47. A scientist suspects that a particular plant contains chloroplasts that lack photosystem II (PSII), even though it is able to live. How could the scientist determine if PSII is missing from the plant's chloroplasts?
- A. Test for the presence of thylakoids in the chloroplasts
 - B. Test for the presence of O_2 in the light
 - C. Test for CO_2 fixation in the dark
 - D. Test for the presence of sugar
48. Which of the events listed below occur in the light independent reactions of photosynthesis?
- A. $NADP^+$ is reduced to NADPH
 - B. CO_2 is reduced to glucose molecule
 - C. Split water molecule and fixation of CO_2
 - D. RUBP is oxidized to GP and phosphoglycolate
49. A grade 12 student conducted an experiment to separate and identify the photosynthetic pigments in spinach leaves using chromatography paper. He took a strip of chromatography paper and marked with a pencil line about 3 cm from one end and placed a small circular spot of pigment extract on the pencil line then, hang the strip inside the jar with specified solvent. The solvent carries the dissolved pigments as it moves up the paper. Which pigment molecule would travel the greatest distance?
- A. Chlorophyll b
 - B. Chlorophyll a
 - C. Carotene
 - D. Xanthophyll
50. Which structure of bacteria enabling them to adhere to host tissue surfaces?
- A. Pili
 - B. Capsule
 - C. peptidoglycan
 - D. Flagellum
51. Why Gram positive bacteria retain the blue or purple color of crystal violet in the gram stain after washing with decolonization reagent (alcohol)? Because they:
- A. have a very thick, rigid peptidoglycan in their cell wall
 - B. have much less **peptidoglycan** in their cell wall
 - C. have lipopolysaccharide on their outer membrane
 - D. their outer membrane produce exotoxin
52. To which of the following groups do those bacteriophages that integrate their DNA into the chromosome of their bacterial host belong?
- A. Virulent viruses
 - B. Lytic viruses
 - C. Lysogenic viruses
 - D. Non-parasitic viruses

53. To prevent the transmission of infectious diseases, which element of transmission cycle of a disease should be controlled?
- The reservoir host
 - The entry of pathogen
 - The pathogens
 - The causing mechanism of pathogens
54. Which one of the following disease is correctly matched with its causative agent?
- | | |
|------------------------------|--------------------------|
| A. Measles ----Bacteria | C. Ringworm-----protozoa |
| B. Farmer's lung -----fungus | D. Syphilis -----Worm |
55. Some biologists say that, strictly, viruses are not microorganisms. This because viruses are/have
- intracellular parasites
 - a genetic material enclosed with protein coat
 - acellular organism
 - no membrane bounded organelles
56. Suppose Abebe suffers in drained of all energy with no apparent reason and the simplest task can be an extreme effort for him. This disease most probably associated with :
- | | |
|----------------------------|-----------------------|
| A. multi factorial disease | C. induced disease |
| B. functional disease | D. Deficiency disease |
57. Which one of the following is **NOT** the role of bacterial in industrial process?
- Production of fermented food
 - Production of antibiotics
 - Production of enzymes
 - To recycle nutrients
58. Which one of the following is **NOT** the common property of all virus particles?
- They are intracellular parasite
 - Possess only one type of nucleic acid
 - They can't metabolism
 - They have envelop that enclose their capsid
59. One of the following statements is true regarding lysogenic reproductive cycle of virus?
- They directly cause a disease by switched off the host chromosome
 - Viral genetic material is incorporated into the DNA of the host cell
 - It is used by virulent virus to replicate their genetic material
 - It produce only enveloped virus and released them by causes lysis the host cell

60. Which of the following is **NOT** usually true as an ecological succession progresses to advanced seral stages?
- A. More ecological niches are formed
 - B. Species become more diverse
 - C. The depth of the soil increases
 - D. Less population are supported
61. Which term 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 richness
62. Which one of the following is **mismatched** between a biome and what it contains?
- A. Tundra → lichens and mosses
 - B. Boreal forest → conifers
 - C. Thorn forest → drought and fire adapted animals
 - D. Desert → epiphytes and ferns
63. Which of the following statements is true about matter and energy in the ecosystem?
- A. Both matter and energy are recycled
 - B. Matter is not recycled; energy is recycled
 - C. Matter is recycled; energy is not recycled
 - D. Energy is recycled more than matter does
64. In nitrogen cycle, which of the following process decreases the available nitrogen in the soil?
- A. Decomposition
 - B. Ammonification
 - C. Nitrification
 - D. Denitrification
65. The part of water ecosystem that contains a mixture of fresh water and salt water and serve as marine nurseries for many juvenile organisms especially fishes is refers to:
- A. Estuaries
 - B. Coral reef
 - C. River
 - D. Pond

66. Which one of the following is the most possible suggestion of low value of index of diversity?
- A. The environment is likely to be suitable
 - B. The area contains most successful species
 - C. The ecosystem is more stable and less hostile
 - D. A few species completely dominating the area
67. Among the following practices, which one has indirect effect/impact on the biodiversity?
- A. Introduction of alien invasive species
 - B. Overhunting (poaching)
 - C. Introduction of improved crop varieties
 - D. high population growth
68. In sulfur cycle, which bacteria degrade dead organic matter in an aerobic condition to released sulfur in the form of H_2S ?
- A. Desulphovibrio
 - B. Thiobacillus
 - C. photosynthetic sulfur bacteria
 - D. Non-photosynthetic sulfur bacteria
69. Of the following Ethiopian biomes, which one has been recognized as a hotspot for biodiversity conservation?
- A. Tropical dry forest
 - B. Temperate grassland
 - C. Easter tropical montane forest
 - D. Dry grassland
70. Which of the following can create strong inter-species competition if shared by two or more species?
- A. Habitat
 - B. Ecosystem
 - C. Niche
 - D. Predator
71. Which event might happen to population if their number exceeded the carrying capacity of their environment?
- A. The population become stable
 - B. the population increase rapidly
 - C. The resource become exhausted
 - D. competition will avoid

72. Suppose gene X, Y, and Z are located on the same chromosome and have Crossover Frequency values between X and Y, 26%, between Y and Z, 10% and between X and Z, 36%. Based on this information which statement will be your possible conclusion?
- A. Gene Y and Z are far apart
 - B. Gene X and Z are more likely that crossing over will occur between them
 - C. Gene X and Y are more closed together than gene Y and Z
 - D. Gene X and Y are unlikely that crossing over will occur between the genes
73. Most of the energy from oxidation of glucose molecule in the tricarboxylic acid (TCA) cycle is temporarily conserved in the form of:
- A. NADH
 - B. FADH₂
 - C. pyruvate
 - D. Acetyl-CoA
74. Which one of the following is **NOT** the feature of sex-linked traits determined by recessive alleles on the X- chromosome?
- A. It is more common in males than females
 - B. The only affected female has an affected father
 - C. It clearly skips a generation and then appear in the males only
 - D. It can be inherited by only females
75. Suppose 50% children's have blood group "A" genotype, 25% of children's have blood group "AB" and "B" genotypes, in which pair or mating you would get such conditions?
- A. AO x AB
 - B. BB x OO
 - C. AA x OO
 - D. AO x BO
76. Which one of the following is a true statement about the semi-conservative replication of DNA?
- A. The original arrangement of parental strands is completely conserved
 - B. The two newly made daughter strands also remain together
 - C. Each daughter duplex contains one strand from the parent structure
 - D. Segments of parental DNA and newly made DNA are interspersed in both strands

77. If the intermediate F1 progeny were allowed to self-pollinate, and 25% of the F2 progeny were tall, 50% were intermediate in size, and 25% were short, this would suggest:
- A. Complete dominance
 - B. Incomplete dominance
 - C. Multiple alleles
 - D. Polygenic inheritance
78. When going from simple to complex, which of the following is the proper order for DNA structure organization?
- A. Nucleotide → double helix → DNA strand → chromosome
 - B. Nucleotide → chromosome → double helix → DNA strand
 - C. Nucleotide → DNA strand → double helix → chromosome
 - D. Chromosome → nucleotide → DNA strand → double helix
79. Which one of the following is true about protein synthesis in prokaryotic cell?
- A. mRNA does not need post-transcriptional processing
 - B. Transcription and translation are takes place in different time
 - C. Transcription takes place in nucleus of the cell
 - D. DNA is transcribed into mRNA after RNA processing
80. Suppose two different animals inhabit the same area but cannot interbreed because they become active at different time of the day. Which reproductive isolation is in operation?
- A. Mechanical isolation
 - B. Habitat isolation
 - C. Behavioral isolation
 - D. Temporal isolation
81. Which one of the following is best represents Lamarck's ideas on the evolutionary process?
- A. Survival of the fittest
 - B. Mutation introduce variation into population
 - C. Inheritance of acquired characteristics
 - D. Natural variations in features are not heritable
82. Which evolutionary theory about the origin of life proposed that life comes from another planet through cosmic dust or meteorites?
- A. Eternity theory
 - B. Panspermia theory
 - C. Spontaneous generation
 - D. Biochemical origin
83. Which process is used by bacteria to transfer antibiotic resistant gene from mutated bacterial plasmid to new species plasmid using viruses as vehicle?
- A. Transformation
 - B. Conjugation
 - C. Transduction
 - D. Conduction

84. Which of the following genetic disorders and its consequences is correctly matched?
- A. Substitution -----Prader-willi syndrome
 - B. Deletion-----sickle cell anaemia
 - C. Addition-----Myelogenous leukemia
 - D. Aneuploidy-----Down's syndrome
85. Suppose some palm trees were survived well in volcanic acidic soils whereas others better in calcareous alkaline soil, natural selection removes the palm trees that grow on neutral soil. Which of the following mode of selection is in operation?
- A. Disruptive selection
 - B. Directional selection
 - C. Stabilizing selection
 - D. Normalizing selection
86. Which evolution can takes place when different species occupy the similar niche and faced the same selection pressure gradually evolve similar structures that adapted for the same function?
- A. Divergent evolution
 - B. Adaptive radiation
 - C. Convergent evolution
 - D. Allopatric speciation
87. If the amount of C^{14} relative to C^{12} in a sample is $1/8$ of in living organism at present. Determine the estimated age of the fossil?
- A. 5730 years
 - B. 11460 years
 - C. 17190 years
 - D. 28650 years
88. In which geologic period does the fossil record shows the major extinctions and more diversity of reptiles?
- A. Cretaceous
 - B. Jurassic
 - C. Permian
 - D. Devonian
89. During human evolution from the earliest hominid to modern human, which one is the major trend (changes) that happens on their appearance?
- A. Increase in the size of the face and teeth
 - B. No skeletal modification in their legs
 - C. Increase in cranial capacity
 - D. Decrease in size of teeth but not the face
90. In which phase of meiotic nuclear division, non-disjunction of sex chromosomes occurs?
- A. Anaphase I and prophase II
 - B. Anaphase I and anaphase II
 - C. Prophase I and anaphase II
 - D. Metaphase I and Telophase II

91. Which one of the following is an example of instinctive behavior?
- A. Scratching behaviour in dogs
 - B. Geese moving eggs that have rolled out of the nest back to the nest
 - C. Maggots moving into a more humid environment
 - D. Producing tears when dust gets in your eye
92. Which caste of the honey bee maintains the social structure of the nest by secreting powerful pheromones within the nest that control the behaviour of the workers at different stages of their development?
- A. Worker bee
 - B. Queen bee
 - C. Drones bee
 - D. Bumblebee
93. All of the following are the main features of eusocial behaviour of insects **EXCEPT**?
- A. The presence of several generation in the colony
 - B. Co-operation in caring for the offspring
 - C. Division of labour
 - D. Increased intra-specific aggression
94. In Ivan Pavlov experiment on dog, which one was considered as unconditional stimulus?
- A. Ringing bell
 - B. Salivation
 - C. The smell of food
 - D. Hungry
95. A newborn human grasping a rope strongly enough so that he can be lifted it. This is an example of:
- A. Somatic reflex
 - B. Autonomic reflex
 - C. orientational behaviour
 - D. Instinctive behavior
96. Which one of the following do honey bees use to inform other bees about the location and distance of a new source of nectar they discover?
- A. Waggle dance
 - B. Buzzing noise
 - C. Pheromones
 - D. Vibration of wings
97. Which one of the following is an innate mechanism of controlling the rhythmic physiological activities of an organism?
- A. Orientational behaviour
 - B. Instinctive behaviour
 - C. Biological clock behaviour
 - D. Courtship behaviour
98. Suppose your mathematics teacher gave you a word problem, you have puzzled over a problem for several days or weeks, and suddenly the answer flashes into your mind. This type of learning behavior is :
- A. latent learning
 - B. Insight learning
 - C. associative learning
 - D. habituation

99. Suppose a girl, after watching her mother making 'enjera' on several occasions, successfully did it herself, what type of learning is this?
- A. Latent learning
 - B. Habituation
 - C. Imprinting
 - D. Insight learning
100. Artificial breeding experiments on the plants and animals provides evidence to evolution because it :
- A. Shows natural selection can produce variations
 - B. Produce new organism with higher yield
 - C. Produce new variations in organisms
 - D. Modifies the gene of organisms and creates new species