

BIOLOGY
 GRADE 12

		Second Letter				
		T	C	A	G	
First Letter	T	TTT } Phe TTC } TTA } Leu TTG }	TCT } TCC } Ser TCA } TCG }	TAT } Tyr TAC } TAA } Stop TAG } Stop	TGT } Cys TGC } TGA } Stop TGG } Trp	T C A G
	C	CTT } CTC } Leu CTA } CTG }	CCT } CCC } Pro CCA } CCG }	CAT } His CAC } CAA } Gln CAG }	CGT } CGC } Arg CGA } CGG }	T C A G
	A	ATT } ATC } Ile ATA } ATG } Met	ACT } ACC } Thr ACA } ACG }	AAT } Asn AAC } AAA } Lys AAG }	AGT } Ser AGC } AGA } Arg AGG }	T C A G
	G	GTT } GTC } Val GTA } GTG }	GCT } GCC } Ala GCA } GCG }	GAT } Asp GAC } GAA } Glu GAG }	GGT } GGC } Gly GGA } GGG }	T C A G

By : Amsalu wakgari

"Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful."

CHOOSE THE BEST ANSWER FROM THE GIVEN ALTERNATIVES

1. Which of the following statement is incorrect?
 - A. Autoclaves help us to increase boiling temperature above boiling point of water to kill germs.
 - B. Disinfectants are chemical substances applied on skin to avoid infection.
 - C. The first antibiotic, penicillin, was developed by Alexander Fleming.
 - D. Prevention of malaria can be achieved by controlling reproduction of female anopheles mosquito.
2. The theory of spontaneous generation was disproved by.
 - A. Louis Pasteur
 - B. Anton van Leeuwenhoek
 - C. Robert Koch
 - D. Van Helmont
3. What does the absence of chloroplasts in unicellular organism indicate?
 - A. Reproduction by sexual means
 - B. Autotrophic nutrition
 - C. Heterotrophic nutrition
 - D. Complete lack of metabolic processes
4. When bacteriophages infect bacteria:
 - A. They inject their DNA only
 - B. They inject their enzymes
 - C. They inject their entire body
 - D. They inject their capsid
5. The genetic information of viruses is enclosed in a molecule of
 - A. Either RNA or DNA but not both
 - B. RNA
 - C. DNA
 - D. Protein
6. A virus is a biologically active particle composed of
 - A. ATP and carbohydrates
 - B. Lysosomes and mitochondria
 - C. Fats and enzymes
 - D. Protein coat and nucleic acid
7. If a new anti-HIV drug is to be developed to prevent the virus from entering the host cell, which one of the following processes should be drug target?
 - A. Reverse transcriptase
 - B. Integration of viral DNA into host DNA
 - C. Binding of Gp-120 and CD4
 - D. Assembly of viral parts into a whole virus
8. Viruses are considered non-living because
 - A. They do not move from place to place
 - B. They cannot reproduce independently
 - C. They do not mutate and therefore do not adapt
 - D. Their nucleic acid does not code for protein
9. The cells of which group of micro-organisms can be described as prokaryotic ?
 - A. Viruses
 - B. Protozoa
 - C. Algae
 - D. Bacteria
10. What is the total magnification power of a microscope with a 10x ocular lens and 25x objective lens?
 - A. 2.5x
 - B. 35x
 - C. 250x
 - D. 2500x
11. Which of the following organisms do not consist of micro-organisms?
 - A. Algae
 - B. Worms
 - C. Bacteria
 - D. Fung
12. What are bacteriophages?
 - A. Bacteria
 - B. Protozoa
 - C. Viruses
 - D. Fungi
13. Which one of the following human diseases can be prevented by taking proper diet?
 - A. Deficiency diseases
 - B. Genetic diseases
 - C. Degenerative diseases
 - D. Social diseases
14. Which one of the following is the major killer of AIDS patients?
 - A. Pneumonia
 - B. Anaemia
 - C. Opportunistic disease
 - D. Malnutrition
15. Among the following human infectious diseases, identify the one that is caused by a virus?
 - A. Yellow fever
 - B. Pneumonia
 - C. Cholera
 - D. Typhoid
16. Which of the following is the right vector to transfer alien genes to bacteria through genetic engineering?
 - A. Plasmids
 - B. Snails
 - C. Mosquitoes
 - D. Bacteria
17. Which one of the following is NOT one of the roles that micro-organisms play in ecosystems?
 - A. Nitrogen fixation
 - B. Nutrient recycling
 - C. Carbon fixation
 - D. Energy recycling

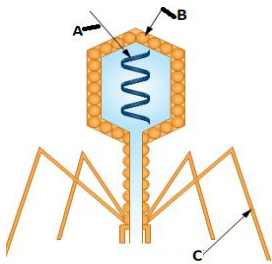
18. Why are T- lymphocytes more vulnerable to HIV infection? Because they have
 - A. Thin cell membrane
 - B. Gp120 on their surface
 - C. HIV receptor protein
 - D. Large pores in their cell membrane
19. Retroviruses have special enzyme that
 - A. Disintegrates host DNA
 - B. Transcribes viral RNA to DNA
 - C. Translates host DNA
 - D. Polymerizes host DNA
20. Which of the following statements is true about bacteria?
 - A. Bacteria found in the human body are all parasitic
 - B. All bacteria are harmful because they spoil foods
 - C. All bacteria cause diseases to plants, animals and humans in some ways
 - D. Some bacteria living in the human body make vitamins needed by the body
21. Which of the following compounds is an important component of the bacterial cell wall?
 - A. Chitin
 - B. Peptidoglycan
 - C. Cellulose
 - D. Pectin
22. What is the term used to express the ability of a microscope to show details clearly?
 - A. Enlargement
 - B. Reduction
 - C. Magnification
 - D. Resolution
23. The cells of which group of micro-organisms can be described as prokaryotic?
 - A. Viruses
 - B. Protozoa
 - C. Algae
 - D. Bacteria
22. Which of the following are rod-shaped bacteria?
 - A. Cocci
 - B. Spirochetes
 - C. Spirilla
 - D. Bacilli
23. Which of the following is the best collective name for all bacteria with spherical shapes?
 - A. Cocci
 - B. Bacilli
 - C. Spirochaetes
 - D. Streptococcus
24. Lytic cycle in viruses
 - A. Kills the host cell
 - B. Stops the multiplication of the host DNA
 - C. Allows the multiplication of the host DNA
 - D. A and C are answers
25. In which kingdom of life is the unicellular eukaryotes grouped?
 - A. Monera
 - B. Protista
 - C. Plantae
 - D. Animalia
26. Surface appendages used by some bacteria to attach to one another, and to host organism are:
 - A. Pilli
 - B. Spirilla
 - C. Pseudopodia
 - D. Cilia
27. In DNA cloning technology, which of the following molecules serves as a vector of gene of interest to be transferred to bacterial host?
 - A. Bacterial DNA
 - B. Plasmid DNA
 - C. Nuclear DNA
 - D. Mitochondrial DNA
28. Viruses are better characterized as?
 - A. Decomposers
 - B. Producers
 - C. Carnivores
 - D. Parasites
29. A virus is a biologically active particle composed of
 - A. Mitochondria and lysosomes
 - B. Protein and nucleic acid
 - C. Enzymes and fats
 - D. Carbohydrates and ATP
30. The genetic information of viruses is encoded in a molecule of
 - A. Either DNA or RNA but not both
 - B. Proteins
 - C. DNA only
 - D. RNA only
31. In which part of the cell do Gram-positive and Gram-negative bacteria differ regarding their staining property with Gram's stain?
 - A. Cytoplasm
 - B. Cell membrane
 - C. Cell wall
 - D. Nucleus
32. An essential aspect of the viral replication is the
 - A. Entry of the viral envelope to the cytoplasm of the host cell
 - B. Release of the viral nucleic acid in the cytoplasm of the cell
 - C. Union of the viral envelope with the nuclear membrane of the cell
 - D. Release of the viral capsid into the host cell nucleus
33. What are the individual strands of a fungal mycelium called?

- A. Fungus B. spores C. Hyphae D. Hydra
34. Choose the one that is NOT a requirement of all living things?
 A. Ability to think C. Response to the stimuli
 B. Organization of parts D. Maintenance of internal constancy
35. Which of the following kingdoms of life consisting of prokaryotic organisms?
 A. Fungi B. Monera C. Protista D. Plantae
36. Viruses are considered as non-living because
 A. They do not move C. They do not mutate and therefore do not adapt
 B. They cannot reproduce independently D. Their nucleic acid does not code for protein
37. Which of the following particles does not normally transmit HIV?
 A. Sexual intercourse through anus C. Blood transfusion
 B. Sharing infected needles D. Shaking hands
38. What are bacteriophages? A. Bacteria B. Viruses C. Protozoa D. Bacteria
39. RNA retroviruses have a special enzyme that :
 A. Translates host DNA C. Disintegrates host DNA
 B. Transcribes viral RNA to DNA D. Polymerases host DNA
40. To which of the following groups do those bacteriophages that integrate their DNA into the chromosome of bacterial host belong?
 A. Virulent viruses B. Lytic viruses C. Lysogenic viruses D. Non-parasitic viruses
41. Under which of the following groups can the fungi be more conveniently placed?
 A. Autotrophs B. Heterotrophs C. Prokaryotes D. Plants
42. What is the advantage of using HAART (Highly Active Anti-Retroviral Therapy)?
 A. It gives a lasting immunity to HIV C. It prevents mutation of HIV
 B. It prevents reinfection by HIV D. It helps to break the life cycle of HIV
43. Which one of the following objective and ocular combinations of the light microscope, respectively, gives the largest field of vision (2003 E. C.)?
 A. 10x and 10x B. 4x and 10x C. 40x and 12x D. 100x and 10x
44. Which of the following diseases is **NOT** sexually transmitted disease?
 A. Gonorrhea B. Syphilis C. Chancroids D. Giardia
45. Which of the following disease is **NOT** caused by parasitic worms?
 A. Taeniasis B. Tuberculosis C. Schistosomiasis D. Ascariasis
46. It is a disease caused by contaminated food and water. Which one is it?
 A. Tuberculosis B. HIV/AIDS C. Cholera D. Malaria
47. Which of the following germ-disease pair is **WRONGLY** matched?
 A. *Plasmodium falciparum* – malaria C. *Treponema pallidum* – Syphilis
 B. *Salmonella typhi* – Cholera D. *Taenia saginata* – Taeniasis
48. Which of the following is true about those bacteria which dwell in hot springs
 A. They get energy of activation from the spring heat C. They use non-protein enzymes
 B. Their enzymes do not denature at that temperature D. They are not metabolically active
49. If a few anti-HIV drugs are to be developed to prevent the virus from entering the host cell, which one of the following processes should be the drug target?
 A. Reverse transcriptase C. Integration of viral DNA into host DNA
 B. Binding Gp120 and CD4 D. Assembly of viral parts into a whole virus
50. Select the function that living things are NOT capable of performing?
 A. Maintain their internal body temperature
 B. Pass genetic information to their offspring
 C. Respond to other organisms found in their surroundings

- D. Determine the amount of radiation reaching the environment
51. A cell was examined under a compound light microscope with an eyepiece lens marked 13x and an objective lens marked 40x. How many times larger would the cell appear to the viewer?
- A. 40 times B. 53 times C. 400times D. 520 times
52. What is the most frequent cause of the agents of food poisoning?
- A. Bacteria B. Protozoa C. Viruses D. Worms
53. Which of the following is true about the antiretroviral drugs currently used to treat AIDS patients?
- A. They cure AIDS C. They serve as anti-HIV vaccines
B. They stop HIV transmission D. They slow down HIV multiplication
54. Which of the following living characteristics UNNECESSARY for an object to be considered a living?
- A. Ability to respond to stimuli C. Ability to grow
B. Ability to reproduce D. Ability to move
55. Which of the following cellular forms did Robert Hooke observe under his crude microscope?
- A. Bacteria B. Protozoa C. Yeast D. Empty cell wall
56. Which of the followings do viruses share with cells?
- A. Cell wall B. Cytoplasm C. Nucleic acid D. Protoplasm
57. Choose the organism that belongs to the eukaryotes?
- A. Bacteria B. Blue green algae C. Amoeba D. Virus
58. Which of the following is true about protozoa?
- A. They are a group of bacteria C. They represent both plants and animals
B. They are one celled plants D. They are unicellular animal like eukaryotes
59. Choose the characteristics that viruses share with living things
- A. They are made up of many specialized cells C. They reproduce by mitosis
B. They contain genetic material D. They contain chlorophyll
60. Which stage in the life cycle of HIV is inhibited by the antiretroviral drug known as *integrase*—inhibitor ?
- A. Conversion of viral RNA to DNA C. Insertion of the viral genome into host genome
B. Replication of the viral genome D. Release of the viral progeny from the cell
61. From which organisms are the first antibiotic used in medicine produced?
- A. Gram-negative bacteria C. Genetically modified protozoa
B. Members of the fungi D. Higher plants
62. What is the difference between HIV and AIDS (2006 E.C.)?
- A. AIDS is the virus and HIV is the diseases C. Both AIDS and HIV refer to the disease
B. AIDS is the disease and HIV is the virus D. Both AIDS and HIV refer to the virus
63. Biotechnology can be applied in environmental remediation. To which of the major application areas of biotechnology is this most related?
- A. Medicine and nutrition C. Biodiversity and industry
B. Medicine and industry D. Agriculture and environment
64. Which of the following is NOT a term used to describe organisms that have had foreign genes added to them?
- A. Genetically modified organisms C. Genetically engineered organisms
B. Transgenic organisms D. Pathogenic organisms
65. What color do Gram-positive bacteria stain with Gram stain ?
- A. Red B. Pink C. Purple D. White
66. Among the following organisms, which one belongs to the prokaryotes?
- A. Paramecium B. Streptococcus C. Spirogyra D. Tapeworm
67. When compared to gram positive bacteria gram negative bacteria is more resistant to antibiotic treatment due its presence of:

- A. Thicker Peptidoglycan layer in their cell wall
 - B. Highly sensitive cell wall to antibiotics
 - C. Special poly lipopolysaccharide layer
 - D. Outer membrane in addition to lipopolysaccharide
68. From the following identify the role that microorganism cannot carry out.
- A. Recycling energy in an ecosystem
 - B. Causing and spreading diseases
 - C. Industrial sewage treatment
 - D. Recycling mineral elements
69. Which of the following statements about prokaryotes is incorrect?
- A. Prokaryotes appeared on earth before eukaryotes
 - B. Prokaryotes have circular pieces of DNA within their nuclei
 - C. Prokaryotes contain cytoplasm
 - D. Prokaryotes contain ribosomes
70. Why CD4 T –lymphocytes is more vulnerable to HIV infection than other cells? Because
- A. It contains gp120 on its surface
 - B. It has large pore on its surface
 - C. It contain HIV receptor on its surface
 - D. It has complex enzyme secretion
71. The primary incubation period of HIV is characterized by a duration of
- A. 20 years before all the symptoms appear in well-nourished people
 - B. 2 weeks to produce enough antibodies
 - C. 3-12 weeks when mild symptoms are manifested
 - D. 2-3 years for the progress of infection for AIDS.
72. Which of the following features makes human T-lymphocyte cells more vulnerable to HIV attack? Presence of;
- A. Cell membrane
 - B. DNA on the chromosome
 - C. CD4 on the membrane surface
 - D. Pores in the cell membrane
73. Which one of the following is the smallest of all?
- A. red blood cell
 - B. A virus
 - C. A bacterium
 - D. An amoeba
74. Which of the following organisms does not contain parasitic members?
- A. Bacteria
 - B. Algae
 - C. Fungi
 - D. Protozoa
75. Which of the following steps in the life cycle of HIV is blocked if an antiretroviral drug that inhibits the reverse transcription enzyme is given to AIDS patients?
- A. Formation of DNA from RNA
 - B. The integration of HIV DNA into host chromosome
 - C. The entry of HIV into CD4Cells
76. To which of the following groups do those bacteriophages that integrate their DNA into the chromosome of their bacteria host belong?
- A. Virulent viruses
 - B. Lysogenic viruses
 - C. Lytic viruses
 - D. Non parasitic viruses
77. Which stage in the life cycle of HIV is disrupted, if AIDS patients are treated with a drug that has a protease inhibiting activity?
- A. Entry of the virus into the host
 - B. Integration of viral DNA into host DNA
 - C. Conversion of viral RNA to DNA
 - D. Assembly of viral parts into whole virus
78. Which one of the following is a routine method used by clinics to test people for HIV infection?
- A. Microscopic examination for the virus
 - B. Testing for human anti-HIV antibody
 - C. Counting the number of white blood cells
 - D. Measuring the amount of hemoglobin
79. One of the following is true about bacteriophages that have lysogenic life cycle?

- A. They are RNA viruses
 B. They integrate their nucleic acid into that of the host
 C. They multiply in the host immediately after infection
 D. Progeny viruses are released by chronic release method
80. Who was the person that first observed living cells moving around when he examined drops of water under the microscope?
 A. Robert Brown
 B. Robert Hooke
 C. Anton Van Leeuwenhoek
 D. Theodor Schwann
81. Which of the following of the cancer is known to mostly develop in AIDS?
 A. Cervical cancer
 B. Stomach cancer
 C. Kaposi's sarcoma
 D. Breast cancer
82. In which of the following groups of living organisms do the cells lack organized nuclei?
 A. Fungi
 B. Protozoa
 C. Bacteria
 D. Algae
83. Which of the following is the major mechanism by which AIDS is transmitted?
 A. Mother to fetal transmission
 B. Heterosexual intercourse
 C. Homosexual intercourse
 D. Contaminated blood transfusion
84. Which of the following diseases is correctly matched with its causative agent?
 A. Malaria—fungus
 B. Ringworm—protozoa
 C. AIDS—virus
 D. Syphilis—worms
85. Among the following identify pairs of enzymes that used to cut gene at specific sequence of DNA and join to bacterial plasmid to form recombinant plasmid respectively during the process of genetic engineering?
 A. Helicase and lyases enzyme
 B. Reverse transcriptase and Ligase enzyme
 C. Restriction endonuclease and Ligase enzyme
 D. Restriction endonuclease and Reverse transcriptase enzyme
86. From the figure the structure of bacteriophage given below letter A, B and C respectively represents



- A. Nucleic acid, protein coat and tail fiber
 B. Nucleic acid, histone protein and tail fiber
 C. Chromosome, histone protein and tail fiber
 D. Chromosome, protein coat and tail tail fiber

87. Identify an alternative that contain correct sequence of bacterial gram staining?
 A. Crystal Violet → Ethanol → Fixation → Iodine Treatment → Counter Stain
 B. Fixation → Crystal Violet → Ethanol → Iodine Treatment → Safranin
 C. Crystal Violet → Ethanol → fixation → Safranin → Iodine Treatment
 D. Fixation → Crystal Violet → Iodine Treatment → Ethanol → Safranin
88. Unlike free living cells, viruses are completely
 A. pathogenic to a living cell
 B. mutual to a living cell
 C. Parasitic to a living cell
 D. Harmful to a living cell
89. Which one of the following is correct concerning the reproductive cycle of viruses?
 A. Both lytic and lysogenic lifecycles release new viruses without the genetic alteration of the host cell.

- B. In lysogenic lifecycle the DNA of the virus integrate with the host cell's DNA.
- C. Both lytic and lysogenic lifecycles undergo the same lifecycle but ending with different results
- D. In lytic lifecycle viruses are released without killing the host cell.
90. Which lone of the following steps in the life cycle of HIV is blocked if an antiretroviral drug that inhibits the reverse transcription enzyme is given to an AIDS patient?
- A. Formation of DNA from RNA C. The assembly of parts into HIV particle
- B. The entry of HIV into CD4 cells D. The integration of HIV DNA into host chromosome
91. Which step in the HIV life cycle is disrupted by an anti-retroviral drug that competitively inhibits the reverse transcriptase enzyme ?
- A. Entry into the host cell C. Assembly of viral parts into a virus
- B. Formation of DNA from RNA D. Interpretation of viral DNA
92. In what way patients benefit from treatment with anti-retroviral drugs?
- A. Reduction of HIV replication C. Immunizing against HIV
- B. Provision of cure from AIDS D. Killing of opportunistic infectious agents
93. Which of the following is the best collective name for all bacteria with spherical shapes?
- A. Spirochaetes B. Bacilli C. Cocci D. Streptococci
94. Which aspect of biotechnology is considered strictly genetic engineering?
- A. Providing gene therapy C. Monoclonal antibodies
- B. Production of new types of plants D. Mapping of the human genome
95. Which of the following microorganisms are prokaryotic?
- A. Bacteria B. Protozoa C. Yeast D. Algae
96. From which of the following diseases can one be protected by sleeping under the cover of a mosquito net
- A. Sleeping sickness B. AIDS C. Malaria D. Athlete's foot
97. Which of the following group of viruses copy their RNA to DNA
- A. Bacteriophages B. DNA viruses C. RNA viruses D. Retroviruses
98. In which one of the following do we use genetically modified bacteria for purposes other than human health?
- A. Production of insulin C. Production of herbicides
- B. Production of antibodies D. Production of vaccines
99. What do we call the place where organisms live in their ecosystem ?
- A. Abiotic B. Biotic C. Habitat D. Niche
100. Which one of the following concepts contains all the others ?
- A. Species B. Genus C. Population D. Community
101. Which of the following statement is true about matter and energy in the ecosystem?
- A. Energy is recycled more than matter does C. Matter is not recycled; energy is recycled
- B. Both matter and energy are recycled D. Matter is recycled; energy is not recycled
102. Which factors are involved in the determination of climax vegetation?
- A. Preys and predators C. Temperature and precipitation
- B. Radiation and reflection D. Grazing and browsing
103. Which of the following is NOT recycled in the ecosystem?
- A. Sulphur B. Energy C. Carbon D. Phosphorus
104. Which of the following is the type of ecological succession that starts from a cleared forest area?
- A. Hydrosere B. Primary C. Secondary D. Pioneer
105. In which one of the following ways the Tundra biome differs from desert biome?
- A. It has little biodiversity C. It receives little precipitation

- B. It has permanently frozen sub-soil
- D. It is a treeless biome
106. Which of the following can be given as a good reason for finding large number of plant and animal species in Ethiopia today?
 - A. Presence of many biomes and habitats
 - B. Lack of ecological disturbance
 - C. Good ecological and biodiversity management
 - D. Environment free from predators
107. Which of the following is the major role played by bacteria and fungi in the ecosystem?
 - A. Causing diseases
 - B. Fixing carbon dioxide
 - C. Nutrient recycling
 - D. Producing antibiotics
108. Which of the following processes is most important to release nutrients from dead organic matter into the soil?
 - A. Respiration
 - B. Fixation
 - C. Decomposition
 - D. photosynthesis
109. In which one of the following aspects is the tropical rain forest biome poor?
 - A. Annual precipitation
 - B. Soil fertility
 - C. Amount of sun light
 - D. Species diversity
110. Which of the following biomes supports the highest diversity of plant and animal?
 - A. Tropical rainforest
 - B. Grass land
 - C. Deciduous forest
 - D. African savannah
111. Which of the following demographic factors can increase the size of the world population?
 - A. Natality
 - B. Migration
 - C. Emigration
 - D. Immigration
112. Among the following, which one is held more responsible for the present fast depletion of the world biodiversity?
 - A. Herbivores
 - B. Hybrid infertility
 - C. Ecological isolation
 - D. Habitat isolation
113. The total amount of living tissue within a given trophic level is called?
 - A. Organic mass
 - B. energy mass
 - C. Trophic mass
 - D. Biomass
114. Biomes where trees predominate are called ?
 - A. Polar biomes
 - B. Forest biomes
 - C. Desert biomes
 - D. Grassland biomes
115. Which group of animals has the highest number of total and endemic species in Ethiopia?
 - A. Amphibians
 - B. Birds
 - C. Mammals
 - D. Reptiles
116. The goals of biodiversity conservation include all of the following EXCEPT
 - A. Protecting individual species
 - B. . Introducing exotic species into new environments
 - C. Preserving habitats and ecosystems
 - D. Making sure that local people benefit from conservation effect
117. What could be the main reason behind the observed slow or stable rate of population growth in the industrialized countries?
 - A. Increasing death rate
 - B. poor health condition
 - C. Good family planning
 - D. Poor health condition
118. What could be the main reason behind the observed slow or stable rate of population growth in the industrialized countries?
 - A. Increasing death rate
 - B. High rate of child death
 - C. Poor health conditions
 - D. Good family planning
119. The maximum population growth rate characteristic of a species is called
 - A. Limiting factor
 - B. Carrying capacity
 - C. Immunology
 - D. Exponential growth pattern
120. Among the following which one is held more responsible for the present fast depletion of world biodiversity ?
 - A. Herbivores
 - B. Grazers
 - C. Carnivores
 - D. Humans
121. If the number of young population is greater than the old population in a given country, its human population tends to
 - A. Grow steadily
 - B. Decrease
 - C. Increase
 - D. Perish

122. When farmers are using fewer and fewer number of crop varieties, what would happen to the genetic diversity of our crop plants?
- It would get eroded
 - It would be more conserved
 - It would be more diverse
 - Nothing would happen to it
123. Which of the following is the most UNLIKELY action that would be expected from Ethiopians who have been given adequate biodiversity?
- Engagement in activities resulting in biodiversity loss
 - Supporting activities concerned with food security
 - Awareness about climate change and its problems
 - Engagement in biological resource conservation
124. Which group of bacteria reduces nitrates to nitrogen gas in the nitrogen cycle?
- Nitrogen fixing bacteria
 - Ammonium ion forming bacteria
 - Denitrifying bacteria
 - Photosynthetic bacteria
125. Which of the following contains members of a single species only?
- Ecosystem
 - Community
 - Population
 - Biosphere
126. If the number of female population is greater than the male population in a given county, its human population tends to
- Increase
 - Decrease
 - Remain constant
 - Disappear
107. The part of the earth that contains life is known as
- Hydrosphere
 - Biosphere
 - Atmosphere
 - Lithosphere
108. The role (the general activities) of an organism in an ecosystem is
- Niche
 - Habitat
 - Food chain
 - Food web
109. Organisms that live and feed on dead organic matter such as decaying wood are known as
- Parasites
 - Herbivores
 - Saprotrophs
 - Predators
110. The major producers in aquatic environment are
- Phytoplankton
 - Blue green algae
 - Bacteria
 - Protozoan
111. Each stage of the food chain is called
- Consumer level
 - Trophic level
 - Grazer level
 - Producer level
112. The best description of climax community is
- Complex and changing
 - Simple and stable
 - Complex and stable
 - Constantly changing
113. The succession on a very dry rock or sand dune is called
- Zerosere
 - Xerophyte
 - Hydrophyte
 - Hydrosere
114. The self-sustaining dynamic community of living things is
- Biome
 - Ecosystem
 - Niche
 - Habitat
115. According to the exponential population growth curve
- Population growth increases and decreases
 - Population growth continues indefinitely
 - The immigration rate falls with increasing population size
 - Population growth stops at the carrying capacity
116. The conversion of atmospheric nitrogen to a usable form is
- Nitrogen fixation
 - Nitrification
 - Denitrification
 - Ammonification
117. The beginning of soil formation from bare rock involves
- Trees
 - Lichens
 - Shrubs
 - Grasses
118. The main factors that determine the types of terrestrial biomes in a certain geographic area?
- Soil and vegetation formation
 - Complexity in ecological succession
 - Soil and biological diversity
 - Precipitation and temperature

119. The highest productivity in a given ecosystem is expected from
 A. Producers B. Herbivores C. Consumers D. Predators
120. Among the following choices, identify the ones that have identical DNA fingerprints?
 A. Parents and children C. Fraternal twins
 B. . Non-twin sibs D. Monozygotic twins
121. Which of the following carcinogenic agents is a common cause of skin cancer in humans?
 A. Ultraviolet radiation B. DNA viruses C. RNA viruses D. Chemical mutagens
122. Which of the following techniques is more appropriate to produce genetically modified organism?
 A. Sexual hybridization C. Artificial insemination
 B. Genetic engineering D. vegetative propagation
123. What is the name of the process of synthesizing mRNA along a DNA template?
 A. Transformation B. Transcription C. Translation D. Translocation
124. If a cell having $2n = 40$ chromosomes divides mitotically, how many chromosomes are expected each daughter cell?
 A. 10 B. 20 C. 40 D. 80
125. During which stage of meiosis do members of homologous pairs of chromosomes separate?
 A. Prophase I B. Anaphase I C. Metaphase II D. Anaphase II
126. The DNA of a certain organism has guanine as 30 percent of its bases. What percentage of its bases would be counted for by adenine?
 A. 10% B. 20% C. 30% D. 60%
127. Scientists successfully transferred and inserted a bacterial gene to rice plants and produced the ‘Golden rice’, a transgenic rice with very high content of vitamin A the grain. Which research technique did they apply in this process?
 A. Normal breeding C. Protoplast fusion
 B. Grafting bacteria to rice D. Genetic engineering
128. In order to produce progeny that are genetically identical to their parents as well as to each other, which of the following methods is appropriate for breeders to use?
 A. Hybridization B. Inbreeding C. Artificial insemination D. Cloning
129. How many codons are there in the genetic code?
 A. 4 B. 16 C. 64 D. 256
130. In humans’ what are the chances that the body at birth would be a boy or a girl?
 A. 1:1 B. 1:2 C. 1:3 D. 3:1
131. The strand that is complementary to the DNA sequence give as TAACCG:
 A. AUUGGC B. TAAGCG C. ATTGGC D. GCCAAT
132. In a DNA strand of 3000 bases, 40% of the molecules are known to belong to guanine. Base. How many adenine base molecules are present in the same DNA strand?
 A. 120 B. 300 C. 600 D. 1200
133. Which of the following hereditary phenomena was not discovered by Mendel
 A. Linkage of genes C. Segregation of genes
 B. Dominance of genes D. Independent assortment of genes
134. Which biotechnological process has practical applications in criminal investigation?
 A. Bio- fuel production C. DNA finger printing
 B. Single cell protein technology D. Using the following to test blood glucose level
135. Choose the cells of the human body that are results of meiosis?
 A. Bone cells B. Brain cells C. Egg cells D. Muscle cells
136. Among the following traits of the garden pea studied by Gregor Mendel, identify the one that did not express itself in the F_1 generation?
 A. Yellow pod colour C. Round seed shape
 B. Violet flower colour D. Axial flower position
137. Suppose a lady has given birth to four boys in a row. What is the chance that her next child will be a girl?
 A. 100% B. 75% C. 50% D. 25%
138. Which of the following mechanisms can separate two genes located on the chromosome?
 A. Backcrossing B. Crossing C. Segregation D. Independent assortment
139. How do the two strands of DNA combine to form a molecule?
 A. A best of one strand pairs with a complementary base of the other strand

- B. The phosphate of one strand combines with the phosphate of the other strand
 C. The sugar of one strand combines with the complementary sugar of the other strand
 D. A ribose sugar combines with a deoxyribose sugar on the same DNA strand
140. What are the three components of a DNA molecule?
 A. Glucose, nitrogen and phosphorus C. Sugar, phosphate group, nitrogenous base
 B. Protein, carbohydrate and fat with base D. Monosaccharide, disaccharide, polysaccharide
141. Of the following information, which one was most important to the development of the techniques of modern genetic engineering
 A. The knowledge about recessive characters
 B. The discovery of lethal genes
 C. The formulation of Punnett squares
 D. The knowledge about the structure of the DNA molecule
142. Which of the following molecules is capable of mutation?
 A. Nucleic acids B. Proteins C. Carbohydrates D. Lipids
143. Suppose a lost found baby is claimed by the four families whose blood genotypes are shown. If the baby has blood type O, which of the families is the possible parent?
 A. AO and BB B. AA and OO C. AO and BO D. AB and OO
144. For what objective do geneticists engineer the Bt gene of bacillus thuringiensis into crop plants? To make the plant
 A. Resistant to insect pests C. Resistant to herbicides
 B. Resistant to pesticides D. Produce food of improved quality
145. Regarding seed characteristics, suppose a heterozygous round yellow pea plant of Rr Yy genotype is selfed and produced 128 seeds, how many of the seeds are expected to be round yellow?
 A. 72 B. 64 C. 32 D. 16
146. In the life cycle of sexually reproduction organisms, which of the following processes restores the chromosome number from haploid to diploid state?
 A. Fertilization B. Meiosis C. Chromosomes replication D. mitosis
147. Which of the following structures divides the cytoplasm of a plant cell into two halves?
 A. Nuclear membrane B. Cell plate C. spindle D. Cleavage furrow
148. In plant hybridization experiment which one of the following is the best way to prevent self-pollination?
 A. To remove the stamens C. To cross-pollinate flowers
 B. To cover flowers with bags D. To make reciprocal crosses
149. Among the following choices, identify the ones that have identical DNA fingerprints?
 A. Parents and children C. Fraternal twins
 B. Non-twin sibs D. Monozygotic twins
150. Suppose in a monohybrid cross 80F₂ plants were produced, what is the number of the plants that are expected to have the dominant and the recessive phenotypes?
 A. 70 dominant + 10 recessive C. 50 dominant + 30 recessive
 B. 60 dominant + 20 recessive D. 40 dominant + 40 recessive
151. In spite of their ability to form hybrids when mated, which one of the following factors is more important to keep the horse and the donkey as separate species?
 A. Their hybrid is not viable C. They cannot form hybrid zygotes
 B. Their hybrid is sterile D. They are ecologically isolated
152. Which of the following contains phosphate group in its molecule?
 A. Nucleotide B. Protein C. Cellulose D. Simple sugar
153. Choose the breeding method used by humans to produce new and improved varieties of plants and animals?
 A. Crossing-over B. Natural selection C. Artificial selection D. Independent assortment
154. Which one is the correct direction of transfer of genetic information in most living things?
 A. Protein → DNA → mRNA
 B. DNA → Protein → tRNA
 C. Protein → RNA → DNA
 D. DNA → RNA → Protein
155. Which one of the following types of mutations is responsible for sickle cell anemia?
 A. Addition of a base pair C. Substitution of a base pair
 B. Deletion of a base pair D. A shift in the reading frame of the genetic code

156. Which of the following phases of mitosis if blocked would produce a cell with twice as many chromosomes as the mother cell?
- A. Interphase B. Prophase C. Anaphase D. Telophase
157. Why is it that the typical diploid chromosome number of many organisms including human beings is an even number?
- A. It is only a coincidence
B. Chromosomes duplicate equal number of chromosomes
C. Both parents contribute equal number of chromosomes
D. Meiosis reduces chromosomes number
158. If, due to incomplete dominance, the F_1 plants from a cross of red flowered X white flowered in the F_2 generation?
- A. 1 red: 2 pink: 1 white C. 1 red: 1 pink: 1 white
B. 2 red: 1 pink: 1 white D. 3 red: 1 pink: 1 white
159. If it is known that the total number of the purine bases account for 50% of a DNA molecule and if each of the remaining bases are known to have the same proportion, what proportion is accounted for by thymine along in the same molecule?
- A. 25% B. 50% C. 75% D. 100%
160. As was shown by Gregor Mendel in garden pea, what percentage of the F_2 generation of a monohybrid cross has the recessive phenotype?
- A. 75% B. 50% C. 25% D. 12.5%
161. Which group of organisms has a system of protein synthesis in which transcription and translation take place at separate times?
- A. In all eukaryotic organisms. C. In multicellular animals only.
B. Only in prokaryotic organisms. D. In both prokaryotic and eukaryotic organisms.
162. What do geneticists call the genotype in which the two alleles of a pair are identical?
- A. Dominant B. Recessive C. Homozygous D. Heterozygous
163. Which one of the following is **NOT** a mutation?
- A. DNA replication to form two daughter DNAs C. Gain of an extra chromosome by a cell.
B. Deletion of a base pair from DNA. D. Loss of a chromosome by a cell.
164. Which of the following is the best way to check whether an individual having a dominant phenotype is homozygous or heterozygous for the trait?
- A. To cross it to a homozygous recess individual C. To cross it to a heterozygous individual
B. To cross it to a homozygous dominant individual D. To self the individual
165. Which one of the following is referred to as the first law of Mendel?
- A. The occurrence of alleles in pairs.
B. The dominance of one allele over the other
C. The equal contribution of alleles by both parents
166. In DNA cloning technology, which of the following molecules serves as a vector of gene of interest to be transferred to be bacterial host?
- A. Bacterial DNA. B. Plasmid DNA. C. Nuclear DNA. D. Mitochondrial DNA
167. A genetic cross between two F_1 –hybrid pea plants having yellow seeds (dominant) will yield what percent green-seeded (recessive) plants in the F_2 generation?
- A. 0% B. 25% C. 50% D. 75%
168. What would most likely results if mitosis fails to be accompanied by cytoplasmic division?
- A. Two cells without nuclei C. One cell without nucleus
B. Two cells each with one nucleus D. One cell with two identical nuclei
169. One of the following is an important cause of gene mutation.
- A. Old age B. Alcoholic drinks C. Smoking D. Radiation
170. How many chromosomes do humans inherit from each of their parents?
- A. 23 chromosomes C. 46 chromosomes
B. 23 pairs of chromosomes D. 46 pairs of chromosomes
171. Which of the following is **NOT** true about the gene called SRY?
- A. It is found on the Y – chromosomes. C. It determines maleness
B. Testes develop in its presence D. Females have two copies of this gene.
172. The sheep 'dolly' is an example of which biotechnological manipulation of animals by human?

- A. Transgenic animal C. Genetically engineered animal
B. Cloned animal D. Hybrid animal
173. Choose the one that is different from all the others.
A. Genetically modified organisms C. Genetically engineered organisms
B. Pathogenic organisms D. Transgenic organisms
174. Gene silencing is the function of one of the following molecules.
A. dsRNA B. mRNA C. siRNA D. tRNA
175. Which process is held responsible for chronic myelogenous leukemia?
A. Translocation B. Translation C. Transcription D. Duplication
176. Two parents of genotype Aa are cross-bred. The alleles show complete dominance. What proportion of the offspring will phenotypically look like their parents?
A. 0 B. $\frac{1}{2}$ C. $\frac{1}{4}$ D. $\frac{3}{4}$
177. Among the following mating, where the ABO blood genotypes of the partners are shown, identify the mating in which all the children will have the same blood type.
A. AO x BO B. AA x OO C. AB x BO D. BB x AO
178. Suppose the amino acid coding region in a mRNA is 1200 nucleotides long, how long is the protein in terms of amino acid number?
A. 1200 amino acids B. 600 amino acids C. 400 amino acids D. 300 amino acids
179. In some human liver cells there are 92 chromosomes per cell. What is the ploidy level of such cells?
A. Haploid B. Diploid C. Tetraploid D. Hexaploid
180. Which of the following choices shows the end products of a mitotic cell division?
A. Gametes and ordinary cells C. Four genetically different cells
B. Two genetically different cells D. Two genetically identical cells
181. What exactly happens during a substitution mutation?
A. One base is replaced by a different base.
B. An extra base is added during DNA replication.
C. A base is missed out during DNA replication.
D. Changes occur in the arrangement or structure of a chromosome.
182. Which of the following group of animals have males with ZZ and females with ZW sex chromosome constitution?
A. Grasshoppers B. Birds C. Mammals D. Honey bees
183. On some crosses of maize, the progeny produces better yield than the parents. What is this phenomenon known as?
A. Dominance B. Heterozygosity C. Hybrid vigour D. Inbreeding depression
184. Which of the following techniques is used to separate DNA fragments according to their size on a gel?
A. Southern blotting C. Electrophoresis
B. Radioactive D. Digestion by restriction enzyme
185. In a cross between round green pea of RRYy genotype and wrinkled yellow pea of rryy genotype, what is the expected genotype of the F₁?
A. RRYy B. rryy C. RRYy D. RrYy
186. Which one of the following is the mechanism by which two genes located on the same chromosome are separated?
A. Independent assortment B. Linkage C. Segregation D. Taking care of the larvae
187. During protein synthesis, where in the cell does transcription take place?
A. Ribosome B. Endoplasmic reticulum C. Nucleus D. Golgi apparatus
188. Which of the following is **NOT** a term used to describe organisms that have had foreign genes added to them?
A. Genetically modified organisms C. Transgenic organisms
B. Genetically engineered organisms D. Pathogenic organisms
189. Which field studies the way in which individual traits of organisms are transmitted from one generation to the next?
A. Genetics B. Ecology C. Evolution D. Morphology
190. Which molecules carry the instructions for protein synthesis?
A. Carbohydrates & lipid B. DNA & RNA C. Amino acids D. Enzymes
191. In protein synthesis, what is produced during transcription?
A. Protein B. DNA C. mRNA D. Polypeptide
192. Which of the following types of chromosome mutations gives rise to an extra chromosome?
A. Inversion B. Translocation C. Deletion D. Non-disjunction
193. Which of the following pairs of individuals have identical DNA fingerprints?

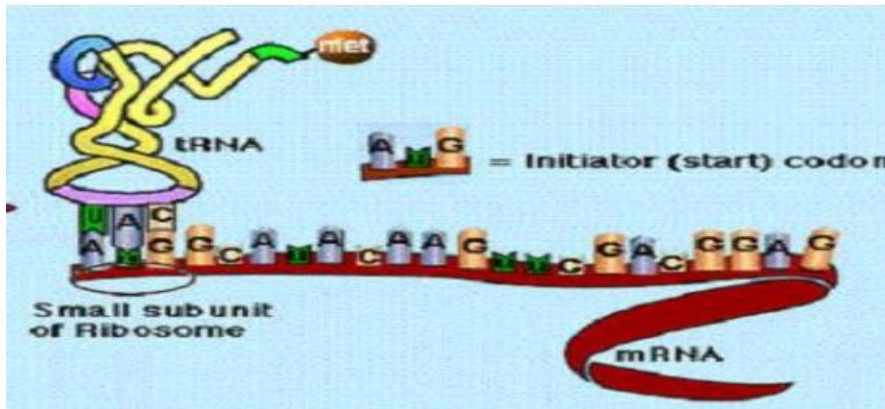
- A. Father and son C. Brother and sister
B. Mother and daughter D. Monozygotic twins
194. Which of the following mating produced children all having the same ABO blood phenotypes?
A. AO x AB B. BB X OO C. AO X BO D. AA X BO
195. Which the following are the two major constituents of eukaryotic chromosomes
A. DNA and RNA B. DNA and Protein C. DNA and Carbohydrate D. RNA and Lipid
196. What is the process called when bacteria directly contact cell to cell and exchange their genetic information
A. Conjugation B. Transformation C. Co - transformation D. Transduction
197. What do you call a group of genetically identical plants produced by vegetative reproduction?
A. Family B. Clone C. Hybrid D. Genus
198. A cow was found to yield much higher milk than any of the breeds of the parental cattle. What could be the most probable reason for this?
A. Dominant genes B. Hybrid vigor C. Recessive genes D. Co-dominance genes
199. 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%
200. Which of the following is the correct constitution of the sex chromosome of a normal woman?
A. A. XY B. XX C. XO D. XXY
201. Which of the following is true about gene mutation?
A. Altering the DNA sequence of a gene B. Change in the position of a block of genes
B. Addition of genes to a chromosome D. Loss of genes from a chromosome
202. What is the circumstance that causes the health condition known as sickle-cell anaemia?
A. DNA denaturation C. Haemoglobin mutation
B. RNA mutation D. Phosphate mutagenesis
203. Based on similarity in number of amino acid found in haemoglobin, which one of the following animals has closer phylogenetic relations to human beings?
A. . Chicken B. Horse C. Frog D. Gibbon
204. Which of the following sequence represents the correct change in number of chromosomes during fertilization?
A. A. $n + n \rightarrow 2n$ B. $2n \rightarrow 2n$ C. $n \rightarrow n$ D. $2n \rightarrow n + n$
205. Which of the following is true about sex determination in birds?
A. They have the heterozygotic X and Y chromosomes
B. Males have heterozygotic W and Z chromosomes
C. Females have the homozygote WW chromosomes
D. They have the heterozygotic W and Z chromosomes
206. What percentage of the F2 progeny of a monohybrid cross is expected to have the recessive phenotype?
A. 100% B. 75% C. 25% D. 50%
207. Which of the following crosses will produce progeny with the phenotype ratio of 3 : 1?
A. Crossing the F1 to the dominant parent B. Crossing two homozygote individuals
B. Crossing the F1 to the recessive parents D. Crossing two heterozygote individuals
208. Which one of the following terms refers to the failure of sister chromatids to separate from one another during anaphase?
A. Non- disjunction B. Replication C. Deletion D. Double inversion
209. In cell division , what is the phase that comes following the metaphase called?
A. Extraphase B. Prophase C. Anaphase D. Telophase
210. If a codon on a messenger RNA is UUU, what is the complementary anticodon on the transfer RNA?
A. . UUU B. GGG C. CCC D. AAA

211. If a clone is produced by transferring a nucleus of animal A to an enucleated egg of animal B and the egg is then implanted in the uterus of animal C, which animal would the clone resemble most?
 A. Animal C B. Animal B C. Animal A D. Other animals
212. If it is known that the total amount of DNA in a cell is 300 units and that adenine alone contributes 70 of these units, how many units go to cytosine?
 A. 40 units B. 70 units C. 80 units D. 35 units
213. Suppose two heterozygous round yellow ($RrYy \times RrYy$) pea plants were crossed and seeds were produced, how many of the seeds expected to be heterozygous round yellow?
 A. 64 seeds B. 32 seeds C. 96seeds D. 128seeds
214. Which characteristic of RNA makes it suitable for moving out of the nucleus?
 A. Inability to replicate C. Its unstable nature
 B. Absence of thymine D. Smallness of its size
215. Which aspects of biotechnology is considered strictly genetic engineering?
 A. Providing gene therapy B. Production of new types of plants
 C. Monoclonal antibodies D. Mapping of the human genome
216. How do different nucleotides of nucleic acids form a strand?
 A. By hydrolysis synthesis B. By condensation reaction
 C. By peptide linkages D. By disulphide bridges
217. Supposing that 1000 individuals were produced from a cross between Bb and bb, how many of them are expected to have the Bb genotype?
 A. 1000 B. 500 C. 50 D. 0
218. A dihybrid cross of round (dominant) yellow (dominant) maize seeds gave all four possible phenotypes. What were the genotypes of the parental plants?
 A. Heterozygous genotypes for the shape and colour B. Heterozygous colour & homozygous shape
 C. Homozygous genotypes for shape & colour D. Heterozygous shape & homozygous colour
219. Individuals of which blood type CANNOT contribute O allele to their children?
 A. Type A B. Type B C. Type AB D. Type O
220. The process by which the genetic information contained in a gene is copied into messenger RNA is
 A. Mutation B. Transcription C. Translation D. Replication
221. Which of the following gives better evidence for resolution of disputed fatherland?
 A. Genetic fingerprinting C. Gene cloning technique
 B. Antigen-antibody reaction D. DNA hybridization
222. Which of the following is true?
 A. Two parents with A and B blood groups can have children with type AB only
 B. Two of the alleles that determine human ABO blood group are co-dominant
 C. A gene may have many alleles but an individual has only one allele per gene
 D. A homozygous red bull & a homozygous white cow produce all red offspring when the alleles are incompletely dominant
223. Which of the following biotechnologies has been used by human for thousands of years?
 A. Genetic engineering B. Alcohol fermentation C. Monoclonal antibodies D. Gene transfer
224. Which of the following parts of the flower did Mendel remove from young flowers to prevent self-pollination?
 A. Stamen B. sepal C. petals D. Ovaries
225. What kinds of cross is performed to determine whether the parent was homozygous or heterozygous?
 A. Monohybrid cross B. dihybrid cross C. back cross D. double cross
226. Among the following ABO blood group genotypes, which one produces two type of antigens
 A. $I^A I^O$ B. $I^B I^O$ C. $I^A I^B$ D. $I^B I^B$
227. Which of the following methods do animal breeders use to produce domestic animals with hybrid vigor?

- A. Feeding with nutritive food C. mating together related animals
B. Giving proper veterinary D. crossbreeding their animals
228. If a heterozygous tall pea plant (Tt) is crossed with a short pea plant (tt), what percentage of the progeny is expected to be short?
A. 100% B. 75% C. 50% D. 25%
229. Which of the following nitrogenous bases of nucleic acid is a purine base?
A. Adenine B. Uracil C. Cytosine D. Thymine
230. Which of the plant with the following genotypes is heterozygous?
A. BBYY B. BbYy C. bbyy D. YYBB
231. Which form of mutation is responsible for the disease known as leukemia?
A. Duplication B. insertion C. inversion D. deletion
232. What is the origin of DNA replication?
A. Particular site at which DNA replication starts
B. B. Site which prevents initiation of DNA replication
C. C. Random location on the DNA where transcription begin
D. D.Site at which replication terminated
233. Both strands of DNA serve as templates concurrently in
A. Replication B. Excision Repair C. Mismatch Repair D. Transcription
234. Men with red-green color blindness inherited the genes for it from:
A. their mothers C. their fathers
B. B. either their mothers or fathers D. their brothers
235. If two parents are heterozygous for a genetically inherited dominant trait, what is the probability that they will have a child together who has this trait in his or her phenotype?
A. 25% B. 50% C. 75% D. 100%
236. The enzyme that removes RNA primers during DNA replication is:
A. RNA polymerase I C. DNA polymerase I
B. B. RNA polymerase III D. DNA polymerase III
237. Which of the following pair of enzymes and their function are incorrectly matched?
A. **DNA ligase** - required to make phosphodiester bonds between two adjacent Okazaki fragments.
B. **Topoisomerase** - prevents the “knotted rope” problem by breaking and rejoining DNA strands to remove tension generated by unwinding of the helix.
C. **Helicase** - moves outward from the origin and breaks hydrogen bonds between DNA phosphodiester bonds.
D. **DNA polymerase** - requires both a template and an appropriately placed 3' end to synthesize a nucleic acid.
238. Gyrase (topoisomerase) is a protein which play crucial role in
A. Separates the DNA strands at the origin
B. Keeps the single-stranded DNA regions from coming back together
C. Re-coils the DNA into a helix after replication is complete
D. Breaks and rejoins the DNA backbone to remove tension produced by the helicase
239. Of the following four 15-bp double-stranded DNA sequences, which will be most stable at higher temperatures? In other words, which will most likely remain in a double-stranded form? (Note: only one strand is shown here) Choose the single best answer.
A. CATCCTAGCGACTAT C. AAATGCATACATCTT
B. B. CTATACGACATAGCC D.CCCGCATCGCCATCG
240. Which of the following pairs of parents is most likely to produce a daughter with hemophilia?
A. A hemophiliac mother and an unaffected father
B. A carrier mother and an unaffected father
C. A carrier mother and a hemophiliac father

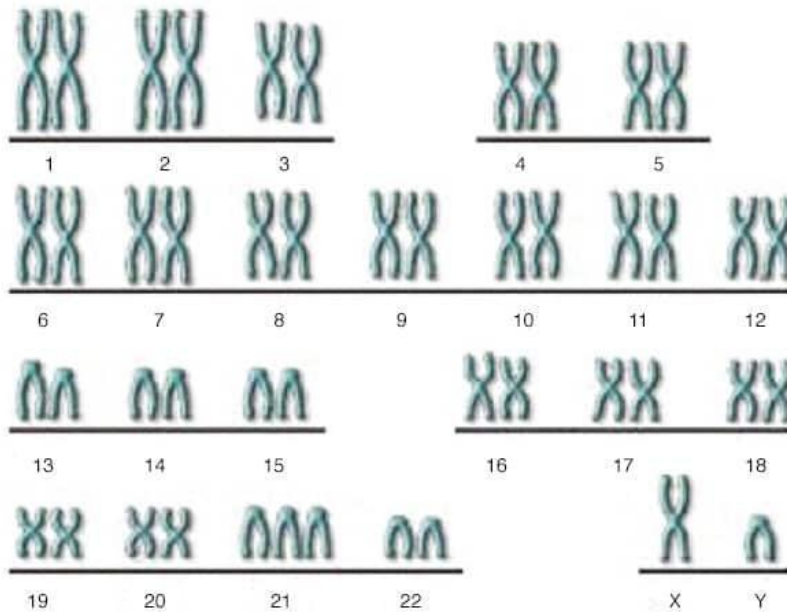
D. An unaffected, non-carrier mother and a hemophiliac father

241. Which stage of protein synthesis described in the following figure?



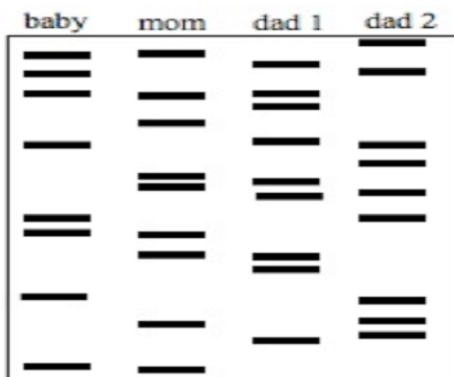
- A. Initiation of transcription
B. Initiation of translation
C. Elongation of translation
D. Termination of translation
242. The genetic code is NOT a:
A. triplet code
C. degenerate code
B. universal code
D. overlapping code
243. Chromosomes are made from two chemicals:
A. DNA and a set of histone proteins
C. DNA and a set of fibrous proteins
B. RNA and a set of histone proteins
D. RNA and a set of fibrous proteins
244. The traits determined by the genes found only on the X chromosome or on the Y chromosome are said to be:
A. Sex-linked traits
C. Sex-limited traits
B. SRY gene traits
D. Sex-influenced trait
245. What are the phase of meiosis, labeled A and B, respectively?
A. Prophase I and Metaphase I
C. Telophase I and Anaphase I
B. Metaphase I and Prophase I
D. Anaphase I and Telophase I
246. What are the TWO types of mutations, labeled D and E, respectively?
A. Addition and substitution mutations
C. Point mutation and chromosome mutations
B. Gene mutation and point mutations
D. Harmful mutations and harmless mutations
247. An anther has 10000 pollen grains. How many pollen parent cells must have been there to produce them?
A. 2000
B. 3000
C. 2500
D. 1
248. A “mini-gene” has the base sequence **TAC CCG TGC ACG**. If the base C at the 9th sequence is substituted by base T, what will be the consequence?
A. All of the codons after that point will be changed
B. Only the amino acid coded for in that codon will be changed
C. Frame shift mutation
D. Silent mutation
249. In the above base sequence, the correct amino acid coded by the triplet code is?
A. Tyrosine, Proline, Cysteine, Threonine
B. Tyrosine, Proline, Cysteine, Serine
C. Tyrosine, Arginine, Cysteine, Threonine
D. Tyrosine, Glutamine, Cysteine, Threonine
250. Which point mutation would be most likely to have a catastrophic effect?
A. A base substitution

- B. A base deletion near the start of the coding sequence
 C. The deletion of three bases near the start of the coding sequence
 D. A base deletion near the end of the coding sequence
251. In a pea plant heterozygous tall and round (TtRr) cross with double recessive (short wrinkled) and produce 1600 seeds. How many seeds expected to be short round? Assume that the two traits are not linked.
 A. 100 B. 400 C. 450 D. 500
252. From the above question (Q. 31) what is the chance of getting individuals phenotypically similar to their parent?
 A. 300 B. 600 C. 900 D. 800
253. Which of the following choices contain the correct sequences on genetic fingerprinting:
 I. a DNA sample is cut into fragments by restriction enzymes
 II. the fragments are denatured by separating the two strands –
 III. the fragments are separated by gel electrophoresis and transferred to a nylon membrane by Southern blotting
 IV. a radioactive gene probe is added to the membrane and the pattern of complementary sequences is revealed using X-ray film
 V. preparation of DNA sample
 A. V, I, II, III, IV B. I, II, III, VI, V C. III, IV, V, I, II D. I, II, III, V, IV
254. What is the role of tRNA during translation?
 A. Bond to open the DNA strand to carry the code for protein synthesis out of the nucleus
 B. Carry ribosomes to the site of protein synthesis
 C. Break apart mRNA and send it back to the nucleus so that it can be reused
 D. Carry amino acids to the mRNA for correct placement into the protein chain
255. Which of the following statements about DNA replication is NOT correct?
 A. The DNA molecule unwinds as the hydrogen bonds are broken
 B. Replication occurs as each base is paired with one exactly like it
 C. The process is known as semiconservative replication because one old strand is conserved in the new molecule
 D. The enzyme that links the Okazaki fragments together is DNA ligase
256. Chromosome A contains genes for an eye color of hazel. Chromosome B contains genes for hair color of hazel, and chromosome C contains genes for albino skin color.
 A. Chromosomes A and B are homologous
 B. Chromosomes B and C are homologous
 C. Chromosomes A and C are homologous
 D. None of the chromosomes are homologous to one another
257. Which of the following chromosomal mutation is detected in the following karyotype?
 A. Down syndrome or Trisomy 21 in male
 B. Klinefelter's syndrome or trisomy 21 in female
 C. Down syndrome or Trisomy 21 in female
 D. Turner syndrome or Trisomy 21 in male



258. Mis. Sena has baby named Eftu . She believes one of two men can be the father of Eftu. A paternity test is done and the results are shown below which of the men are baby Eftu's father?

- A. Dad 1 B. Dad 2 C. None of them D. both



259. Select the correct sequence that occurred in the primitive earth.

- A. Gases, macromolecules, small molecules and protocells
B. Macromolecules, small molecules, protocells and gases
C. Gases, small molecules, macromolecules and protocells
D. Protocells, macromolecules, small molecules and gases

260. Evolution by natural selection requires.

- A. heritable genetic difference
B. Differential adaptation
C. Variation
D. Differential reproduction
E. All of the above

261. Some species gradually evolve into a new species without splitting into two or more species. Which mode of evolution is operating in this case?

- A. Allopatric speciation B. Sympatric speciation
B. Convergent speciation D. Phyletic speciation E. Divergent

262. Compared to the others, which one of the following plants is found at a higher level of evolutionary advancement?

- A. Podocarpus B. Moss C. Grass D. Algae
263. In earliest fossils found in the geologic record are:
A. Protozoa B. Fungi C. Bacteria D. Angiosperms
264. On which of the following evolutionary ideas do Lamarck and Darwin fully agree?
A. Life is a result of natural process - C. Acquired characteristics are inherited
B. Natural selection leads to evolution D. A and B
265. Which group of hominids is called the handy human?
A. *Homo sapiens* B. *Homo habilis* C. *Homo erectus* D. Australopithecus.
266. Which evolutionary evidence was very unlikely to have been used by Darwin in the formulation of the theory of evolution?
A. Comparative anatomy C. Geographical distribution
B. Comparative biochemistry- D. Fossils
267. Which of the following theories is most accepted by scientists?
A. Neo-Darwinism B. Darwinism C. Lamarckism D. A and B
268. The paper entitled 'philosophie zoologique' was written in 1809 by:
A. Aristotle B. Darwin C. Lamar D. Alexander
269. According to Lamarck's theory of evolution, what is the origin of new structures that are necessary for evolution?
A. Mutation C. Natural selection
B. Gene recombination D. Use and dis-use of body parts -
270. The bones in human hands, flippers of the whale and wings of the birds are known as what?
A. Homologous structures C. Analogous structures
B. . Divergent selection D. Vestigial structures
271. Which kind of selection does a bell-shaped curve in a variable indicate?
A. Disruptive selection C. Stabilizing selection
B. Unidirectional selection D. Divergent selection
272. Which of the following processes of evolution best explains the phenomenon known as industrial melanism?
A. Adaptive radiation C. Disruptive selection
B. Stabilizing selection D. Directional selection
273. Animals without close evolutionary relations are sometimes seen to have similar structures adapted for the same function. Which evolutionary principle is illustrated by this observation?
A. Convergent evolution C. sympatric evolution
B. Divergent evolution D. Allopatric evolution
274. What is the reproductive isolating mechanism called if two species of frogs do not interbreed because they cannot understand the mating calls of one another?
A. Habitat isolation C. Behavioral isolation
B. Temporal isolation D. Seasonal isolation
275. Which of the following includes all the others?
A. Hominids B. Hominins C. Great apes D. Primates
276. What percentage of the amount of carbon 14 originally present in a fossil would be left after its second half life?
A. 75% B. 50% C. 25% D. 12.5% E. 6.25%
277. According to the theory of evolution as proposed by Charles Darwin, which one of the following is the most important driving force of evolution?
A. Mutation B. Over-reproduction C. Genetic recombination D. Natural selection
278. Directional selection:

- A. Operates in response to gradual change in environmental conditions
 - B. Favors one extreme phenotype from the population
 - C. Leads to a shift in the population mean for the selected character
 - D. Reduces variation
 - E All of the above
279. Which of the following statements is correct?
- A. Natural selection helps in the development of new phenotypes.
 - B. Stabilizing selection is one main process of natural selection.
 - C. Stabilizing selection favors the extreme phenotypes.
 - D. Stabilizing selection cause a shift in the direction of variation due to environmental change.
280. Stabilizing selection:
- A. selects those individuals with a phenotype near the mean
 - B. Operates to reduce the population's variability
 - C. Is common in an environment that has been stable for an extended period of time.
 - D. All of the above
281. Which of the following is a wrong statement?
- A. In hunter/ gatherer societies, everyone was responsible to obtain food
 - B. Obtaining food by hunting and gathering was more time consuming than agriculture for early man.
 - C. The development of agricultural societies made people to deal with religion, art and art crafts.
 - D. A and B
282. Which of the following is man's distinctive biological feature?
- A. Bipedal, gait, learning and intelligence
 - B. Making and using tools,
 - C. rapid development of cerebral cortex
283. Which of the following is **not** a significant advancement in agriculture revolution?
- A. The development of hunter /gatherer societies
 - B. The development of agriculture
 - C. The industrial revolution
 - D. None of the above
284. The Peking man and Java man are examples of
- A. *Homo erectus*
 - B. *Homo habilis*
 - C. *Homo sapiens*
 - D. *Neanderthalis*
285. *Homo erectus*:
- A. evolved in Africa and migrated to Europe and Asia
 - B. was taller than *Homo habilis*
 - C. was bipedal and fully erect
 - D. A and B
286. Humans do possess a greater intelligence and have been able to maximize this intelligence through:
- A. Cultural evolution
 - B. Artificial selection
 - C. Natural selection
 - D. Genetic engineering
287. Which of the following is prevented from taking place if populations are separated by geographic barrier?
- A. Gene flow
 - B. Evolution
 - C. Natural selection
 - D. Mutation
288. Which one of the following is wrong?
- A. Plants do not exhibit hybrid inviability
 - B. Speciation is more likely to occur if the original isolated population is large
 - C. Gametes of interspecific hybrids become abnormal if its parents have different chromosome number
 - D. Geographical speciation is the most common and most important in the evolution of new species of animals

289. To which genus of human like organism does Lucy belong?
 A. The genus *Australopithecus* C. The genus *Ardipithecus*
 B. The genus *Homo* D. None of the above
290. Which of the following features is more characteristic of human than of apes?
 A. Large supraorbital ridges B. Opposable big toe C. Small canines D. A and B
291. Which of the following is the nearest to the common ancestors of the hominid and the apes?
 A. *Homo habilis* B. *Homo erectus*
 C. *Ardipithecus ramidus* D. *Australopithecus afarensis*
292. The first hominid to have enough human features to be placed in the same genus as modern humans is:
 A. *Homo erectus* B. *Homo sapiens* C. *Homo habilis* D. *Homo afarensis*
293. The earliest hominids belong to the genus:
 A. *Australopithecus* B. *Homo* C. *Afarensis* D. Prosimians
294. *Homo habilis*
 A. Is the first hominid to have enough human features
 B. Was the first to consciously design tools
295. The most ancient hominids are assigned to the species.
 A. *Australopithecus* B. *A. robustus*
 C. *A. africanus* D. *H. habilis*
296. Which of the following statements are correct?
 A. In early hominids a bipedal posture evolved after their brain enlarged
 B. Human evolution occurred in Asia
 C. The greater curvature of the spine in human skeleton allow for better balance and weight distribution.
 D. In human skull the foramen magnum (opening at the base of skull) is located at the back
 E. Human evolution occurred in Asia
297. One of the most significant features of primates is that:
 A. They have five digits on their hands and feet
 B. Their eye is located in front of the head
 C. They have an opposable thumb D. All of the above
298. In convergent evolution
 A. Populations of the same species become increasingly different.
 B. Species in the same environment have evolved in similar ways
 C. Two species look very much alike and are adapted to similar evolutionary conditions, but they are evolutionary unrelated D. A and C
299. If two species look very much alike and adapted to similar environmental conditions, but are evolutionary unrelated, the type of their evolution is referred to as:
 A. Parallel evolution B. Divergent evolution
 C. Convergent evolution D. Sympatric evolution
300. An individual that possesses multiple sets of chromosomes, in which one or more of those sets came from a different species is known as:
 A. Polyploid B. Cladogenetic C. Anagenetic D. Trisomic
301. The most important method of speciation in animal evolution is
 A. Polyploidy C. Sympatric evolution
 B. Allopatric speciation D. Ecological isolation
302. When two closely species that are found in the same geographical range reproduce at different times of the year, this is known as

- A. Seasonal isolation C. Temporal isolation
B. Geographical isolation D. Temporary isolation
303. The first photo-autotrophic organisms were likely to have been
A. green algae B. sulfur bacteria C. plants D. blue green algae
304. All forms of the cosmozoan (panspermia) theory suggest that:
A. Life forms arrived on Earth from other celestial bodies
B. Life forms arrived on Earth due to radiation pressure
C. Organic molecules arrived on Earth in meteorites
D. Other celestial bodies have been important in the origene of life on Earth.
305. From the time when oxygen was first produced on the planet, it took approximately how many years for the levels to begin to rise?
A. 1,000,000 B. 1,000,000 C. 100,000,000 D. 1,000,000,000
306. The eternity of life theory suggests that:
A. all life forms are eternal C. life will go on forever
B. life has always existed and always will D. all of the above
307. The scientists who developed the theory of abiogenesis were
A. Miller and Bernal B. Miller and Oparin C. Bernal and Haldane D. Oparin and Haldane
308. All forms of the cosmozoan (panspermia) theory suggest that
A. life forms arrived on Earth from other celestial bodies.
B. life forms arrived on Earth due to radiation pressure
C. organic molecules arrived on Earth in meteorites
D. other celestial bodies have been important in the origin of life on Earth
309. In the past spontaneous generation has suggested that
A. life can be created from non-living matter
B. flies can be created from rotting meat
C. microorganisms can be created from non-living matter D. all of the above
310. In comparing Darwin's theory of evolution with Lamarck's it is true to say that
A. Darwin based his theory on natural selection whilst Lamarck based his theory on use and disuse
B. Lamarck believed that variations arose out of a need to change whereas Darwin suggested that variations were already present in populations
C. Both suggested that new species could evolve eventually D. all of the above
311. What do you call structures that have the same evolutionary origin even though they may now have different structural make ups or functions ?
A. Endemic B. Analogous C. Homologous D. Indigenous
312. "Rats can be produced by keeping rags and grains at a corner of a room". Which of the following line of thinking supports this statement ?
A. Darwinian evolution B. Spontaneous generation
C. Alternation of generation D. Sexual reproduction
313. What is the specific name of biological scientists who do research that tries to find evidence of life on other planets in the Solar system ?
A. Neurobiologists B. Paleontologists C. Astrobiologists D. Biogeography's
314. Why are mutations considered important in evolution ?

- A. They are usually related to the environment. C. They are always beneficial to the organism .
 B. They contribute to new variations in organisms D. They become causes for species migrations
315. Which of the following pairs are ANALOGOUS structures ?
 A. The human arm and the front leg of a mule C. The wing of a bird and the wing of a butterfly
 B. The front leg of a frog and the wing of a bat D. The wing of a bat and the wing of a bird
316. Which of the following changes that happened during human evolution had the most contribution to the evolutionary success of Homo sapiens ?
 A. Proportionately big brain size to body mass
 B. Long legs, arms and more upright body posture
 C. Big body parts and big overall body mass
 D. Fast running ability and overall physical strength
317. Woodlice are observed avoiding light and heat by quickly moving to moist and darker areas. Which behavior of these animals helps them to detect differences in light intensity and move to the darker and moist part of the habitat?
 A. Instinctive learning B. Negative photo taxis C. Postitivephototaxis D. Insight learning
318. Choose the one that had the LEAST contribution to human evolution?
 A. Development of bipedalism C. Attaining opposable thumb
 B. Adaptation to flight D. Increasing brain size
319. What does an evolutionary selective pressure that acts around the mean do ?
 A. It stabilizes B. It terminates C. It converges D. It disrupts
320. In his theory of evolution, the cause of which of the following concepts was MISSING in Darwin's explanation ?
 A. Over- reproduction B. Struggle for survival
 B. Hereditary variation D. Survival of the fittest
321. Which of the follwng pairs and ANALOGOUS structures ?
 A. The human arm and the front leg of a mule C. The wing of a bird and the wing of a butterfly
 B. The front leg of a frog and the wing of a bat D. The wing of a bat and the wing of a bird
322. 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 contribution to the evolution of the human species
 C. Human ancestry had no relation whatsoever with that of the chimpanzees
 D. Fossils of Lucy and Ardi provided evidence for human origin.
323. Which of the following is an evolutionary requirement for two sub-populations of a species to evolve into independent species?
 A. Free exchange of genes C. Free migration between populations
 B. Geographic isolation D. Absence of natural selection
324. From evolutionary point of view, which of the following animals is expected to have hemoglobin proteins that are least similar to that of human ?
 A. Ape B. Cow C. Chicken D. Frog
325. Which of the following expression is more related to the pharase "survival of the fittest"?
 A. Natural selection B. Mendelian inheritance
 C. Gene mutation D. Inheritance of acquired characteristics
326. If a substance that weight 2,000 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. 500years
327. 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 C. Thirty thousand years
 B. Twenty thousand years D. Forty thousand years

328. Which of the following came first in the course of organic evolution ?
 A. photosynthetic organism C. Land plants
 B. Free oxygen in the atmosphere D. Multicellular organisms
329. In which hominid species did scientists find the smallest brain size (cranial capacity)?
 A. Homo sapiens B. Homo Habilis C. Homo erectus D. Homo neanderthalensis
330. Which of the following theories explains evolutionary changes of living things in terms of changes in their allele frequencies?
 A. Darwin's natural selection C. Inheritance of acquired characteristic
 B. Spontaneous generation D. Neo – Darwinism
331. What is the reproductive isolating mechanism called if two species of frogs do not interbreed because they cannot understand the mating calls of one another?
 A. Seasonal isolation C. Temporal isolation
 B. Behavioral isolation D. Isolation by distance
332. Among the following, which one is the best criterion to show that two populations belong to same species?
 A. Morphological similarity C. Inhabiting the same geographic area
 B. Physiologically similarity D. Production of fertile offspring
333. In the process of the evolution of life on earth, which of the following four processes evolved last?
 A. Photosynthesis B. Aerobic respiration C. chemosynthesis D. photo – autotrophism
334. Which of the following characteristics can show the evolutionary relationships among organisms?
 A. Structures having similar functions C. Structures having common origin
 B. Structures having same size D. Structures having different origins
335. Which one of the following factors is NOT important for evolutionary change of a population?
 A. Over reproduction C. Existence of heritable variation
 B. Insufficiency of natural resources D. Survival of all that are born
336. In which geologic period does the fossil records show more diverse and relatively higher forms of organisms?
 A. Devonian B. Cretaceous C. Jurassic D. Permian
337. To which genus of human – like organisms does Lucy belong?
 A. The genus Homo C. The genus shahelanthropus
 B. The genus Ardipithecus D. The genus Australopithecus
338. Which of the following idea is NOT a part of Darwin's Theory of Evolution?
 A. Over reproduction C. Existence of heritable variation
 B. Use – and discuse of body parts D. Competition for scarce resources
339. Which of the following fossils is the nearest to the common ancestor of the hominids and the apes?
 A. Homo habilis C. Ardipithecustramidus
 B. Homo erectus D. Australopithecus afarensis
340. Which group of organisms found in Ethiopia is represented by the highest number of endemic taxa?
 A. Mammals B. Amphibians C. Birds D. Plants
341. Which of the following is true about the evolutionary origin of groups of organisms?
 A. The dinosaurs appeared before the origin of the land plants.
 B. The earliest Homo sapiens appered before the flowering plants
 C. The first photosynthetic organisms appeared before the oldest eukaryotes
 D. The first animals appeared before the formation of free O₂ in the atmosphere
342. Why are fossils of soft – bodies organisms usually relatively rare in the environment?
 A. They are generally small in size C. They all lived in environments where sedienatin did not occur
 B. Their bodies decompose readily D. They were never common in environments in which they lived
343. Carbon 14 has a half-life of about 5730 years. Suppose a fossil contains only 12.5% of the amount of carbon 14 normally present in living organisms, how old is the fossil?

- A. 5730 years B. 11460 years C. 17190 years D. 22920 years
344. Which of the following pairs of molecules can give information about how much two species are evolutionary related to one another?
- A. DNA and proteins C. Lipids and carbohydrates
B. Starch and cellulose D. Carbohydrates and proteins
345. What does the structural similarity between the flippers of whales and arms of humans show?
- A. Whales evolved from the human species C. The human species began life in the oceans
B. Whales are older than the human species D. Whales and humans had a common ancestry
346. When two species are compared, which of the following sources of evidence is least informative about the degree of relationships between the species?
- A. Nucleotide sequences of DNAs C. Glucose e sequence of polysaccharides
B. Amino acid sequences of proteins D. DNA – DNA hybridization
347. Which hormone promotes human sleepfulness in darkness and controls the sleep- wake cycle ?
- A. insulin B. Adrenaline C. Melatonin D. Thyroxine
348. Which hormone promotes human sleepfulness in darkness and controls the sleep- wake cycle ?
- A. insulin B. Adrenaline C. melatonin D. Thyroxine
349. To which one of the following classes of stimuli do pheromones belong ?
- A. Auditory B. Smell C. Visual D. Touch
350. Which of the following is NOT true about innate behaviors?
- A. can be improved by trial and error C. Present at birth or on hatching
B. Common to all members of the species D. Do not have to be learned
351. If someone suddenly removes his/her hand from a very hot object, which of the following types of behavior is manifested?
- A. Reflex action B. Imprinting C. Learned behavior D. Sensitization
352. Which of the following involves trial and error learning ?
- A. Operant conditioning B. Habituation C. Sensitization D. Classical conditioning
353. Which of the following is responsible for the bending of a young plant towards a unidirectional source of light ?
- A. Reduced photosynthesis on dark side C. Reduced auxin concentration on dark side
B. Faster growth rate on the dark side D. Increased rate of cell division on the light side
354. Which of the following is a learned behavior ?
- A. Suckling of then wborn at mother's breasts
B. Withdrawal of hands suddenly from hot objects
C. Salivation by conditioned dogs at the sound of a bell
D. Blinking the eyes when something gets in to them
355. 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
356. Baby ostriches tend to following the first moving object that they see as they hatch out of the eggs. What kind of animal behavior does this demonstrate?
- A. Positive taxis B. innate behavior C. positive kinesis D. learned behavior
357. Which of the following is NOT true about instinctive behavior ?
- A. It can be developed further trough learning C. It has a fixed action pattern
B. It is triggered by a key stimulus D. It is adaptive for the species
358. Suppose when you first enter a room you notice an unpleasant smell which you eventually forget about its presence , what is this behavior called ?
- A. latent learning B. insight learning C. Habituation D. operant conditioning
359. Which one of the following is an example of an orientational innate behavior ?
- A.Kineses in woodlice C. Sudden withdrawal of limbs from hot object

- B. Blinking of the eyes D. Nest building by weaver birds
360. Which one of the following do bees use to inform other bees about the location and distance of a new source of nectar they discover?
- A. Pheromones B. Waggle dance C. Buzzing noise D. Vibration of wings
361. Which of the following is NOT classified as a learned behavior?
- A. Insight B. Innate C. Latent D. Conditioned
362. What do we call the learned behavior if a mouse that had just escaped from the mouth of a cat jumped violently at a slight touch by a trivial object?
- A. Latent learning B. Sensitization C. Conditioning D. Imprinting
363. The group of the Ethiopian wolf which does NOT contribute to territory making with their urine containing pheromones is
- A. Adult males C. Sub – adult males
B. Adult females D. sub – adult females
364. To what kind of animal behavior can the spinning of a web by a spider be classified?
- A. Learned behavior C. Instinctive behavior
B. Experiential behavior D. Accidental behavior
365. During seasons of reproduction, the males of some species of birds produce colourful feathers to attract females. What do ethologists call this method of communication in animals?
- A. Visual B. Chemical C. Auditory D. Touch
366. What is the role of the worker honey bee just after it emerges?
- A. Forage for nectar, pollen and water C. Guard the hive
B. Clean out dirty honeycomb D. Build honeycomb
367. Which of the following types of movements in response to a stimulus has no specific direction?
- A. Taxis B. Kinesis C. Gravitropism D. Phototropism
368. In the classical conditioning experiment performed by pavlov on dogs, which of the following alternatives is the unconditioned stimulus?
- A. The sound of the bell C. The salivation at the sound of the bell
B. The smell of the food D. The salivation at the smell of the food

"Success is not the key to happiness. Happiness is the key to success. If you love what you are doing, you will be successful."