EST II – Individual Subject Test

Student's Name _____

National ID _____

Test Center: _____

Subject: Biology

Duration: 60 minutes

80 Multiple Choice Questions

Instructions:

- Place your answer on the answer sheet. Mark only one answer for each of the multiple choice questions.
- Avoid guessing. Your answers should reflect your overall understanding of the subject matter.
- Calculator is not allowed.

Directions: In this section of the exam, each question or incomplete statement is followed by five possible answers or completions. For each of the following problems, choose the best answer from the given list of possible choices.

1. A laboratory technician started observing cells during their division. He observed chromosomes moving towards two different poles of the cell. He called this polar ascension.

In which phase is polar ascension observed?

A. Prophase
B. Metaphase
C. Anaphase
D. Telophase
E. Interphase

2. In spring and winter, the food of the fox is mostly small rodents due to the lack of fruits. By contrast, in summer and autumn, its food consists of 50% fruit.

So the diet of fox, as function of seasons, is:

A. Herbivorous
B. Zoophagous
C. Insectivorous
D. Carnivorous
E. Omnivorous

3. Following fertilization, parts of the flower fades. A flower structure is transformed into fruit. Which one?

A. Petals
B. Sepals
C. Stamens
D. Ovary
E. Ova

Questions 4-6:

In a certain population of foxes, there are two alleles for coat color, red and white. Red is dominant and white is recessive. The frequency of white-colored foxes is 20%. Eagles are also present in the area, and foxes constitute a major portion of their diet. Eagles recognize prey when they do not blend in to the environment.

4. What is the frequency of the allele for red coat color in the foxes?

A. 0.09
B. 0.03
C. 0.3
D. 0.6
E. 0.9

5. In this population of foxes, what percentage is hybrid red?

A. 7%
B. 48%
C. 50%
D. 81%
E. 91%

6. If the climate were to change so that snow covered the ground much of the time, what change in the population of foxes would you expect?

A. The frequency of white allele would increase
B. The frequency of white allele would decrease
C. The frequency of red allele would increase
D. The population of foxes would decrease and then increase
E. The population of foxes would increase and then decrease

7. In the ABO blood group system, the alleles behave as follows:

A. A//A is the genotype of group A which is homozygous
B. A//B is the genotype of group A which is heterozygous
C. A//O is the genotype of group A which is homozygous
D. The two alleles A and O are codominant
E. Allele A is dominant over allele B

8. Red blood cells are placed in three solutions of different concentrations. The microscopic observations of these cells are done and the results are shown in the following table:

Solution number	1	2	3
Concentration of the solution in % (g/cc)	0.03	0.09	26
Aspect of red blood cells	Red blood cells bulge and lyse	Red blood cells remain normal	Red blood cells shrink

We consider that the cytoplasm of red blood cells has a concentration of 9 grams/100cc. which statement is INCORRECT?

A. The red blood cells lyse in solution 1 because the water passes by osmosis from the exterior hypotonic medium into the interior hypertonic medium
B. The red blood cells lyse because the cytoplasmic concentration is less than that of solution 1 thus leading to enormous turgidity
C. The red blood cells remain normal in solution 2 because both the intracellular and extracellular media are isotonic
D. The red blood cells shrink because water exits from the hypotonic medium to the hypertonic medium by plasmolysis in solution 3
E. The red blood cells don't lyse because there is no exchange that occurs between the two media in solution 2

9. The complete cardiac cycle involves three phases: the auricular systole, the ventricular systole and the general diastole.

Which is the correct statement?

A. During the auricular systole, the blood leaves the auricles by the arteries
B. During the ventricular systole, the blood leaves the ventricles by the veins
C. During the general diastole, the blood comes back to the auricles by the veins
D. During the general diastole, the blood comes back to the auricles by the arteries
E. During the ventricular systole, atrioventricular valves are opened

10. A biology class was performing an experiment in the lab. The students had obtained a DNA strand with radioactive thymine. Later as they left the strand in a medium for multiplication, they realized that the radioactivity was observed only in part of the DNA and not all DNA molecules.

The process was explained by the teacher as:

A. DNA translation
B. Cell proliferation
C. Semi-conservative replication of DNA
D. Conservative replication of DNA
E. Semi-conservative translation of DNA

Questions 11-13:

An experiment was carried out on variegated leaves (the periphery of the leaves is white because it's deprived of chlorophyll). An experimental device makes it possible to place certain leaves under various conditions (presence or absence of carbon dioxide, presence or absence of light) for 24 hours. At the end of the experiment, the leaves to be tested are discolored and then iodine test is carried out. Discoloration only intervenes to prevent natural pigments from masking reactions with iodine.

The following table shows the results obtained:

Leaf 1	**Leaf 2**	**Leaf 3**	**Leaf 4**
Control leaf (natural conditions)	Leaf having received carbon dioxide-free air	Leaf whose green part has been covered by a black cover	Leaf partially covered with a black cover

11. In which leaf/ leaves is the blue color seen only in the central region?

A. Leaf 1
B. Leaf 2
C. Leaf 3
D. Leaf 3 and 4
E. Leaf 2 and 4

12. Which leaf/ leaves show(s) the same aspect as leaf 2?

A. Leaf 1
B. Leaf 1 and 3
C. Leaf 3
D. Leaf 4
E. Leaf 1 and 4

13. When the leaf is partially covered with a black cover (leaf 4), the blue color appears:

A. Only in the primarily green central region
B. Only in the primarily green central region not covered by the cover
C. Only in the white periphery of the leaves
D. In the central region and the peripheral region (the whole leaf)
E. Only in the white periphery not covered by the cover

14. The Amur bitterling are fish that live in rivers. At the time of reproduction, the female develops a long tube called the egg-laying tube. When a male meets a female with this tube, he swims around her and guides her to a freshwater mussel. The female deposits her eggs (30 to 40) in the respiratory cavity of the mussel using her laying tube. The male thus releases his sperm near the mussel.

The nature of the stimulus is:

A. Visual
B. Auditory
C. Olfactory
D. Gustatory
E. Both visual and auditory

15. Which of the following is LEAST likely to result in speciation?

A. Random mating among members of a large population of a species
B. Occurrence of hybridization between individuals from two different species
C. Development of different mating behavior by some members of a species
D. Emigration to a specialized microenvironment by some members of a species
E. Formation of a physical barrier that blocks gene flow between members of a species

16. The following table shows the results of an experiment made in order to test the duration of seed germination as a function of temperature.

Temperature (° C)	2	8	12	16	20	25	30	35	40
Duration of seed germination (days)	-	8	6	4	3	2	3	6	-

On the basis of the data above, a temperature of:

A. 20 ° C permits a very fast development
B. 35 ° C maximally slows down seed germination
C. 25 ° C permits a very fast development
D. 8 ° C permits a very fast development
E. 12 ° C maximally slows down seed germination

17. A DNA nucleotide consists of:

A. Phosphate group, deoxyribose sugar and nitrogenous base (A, C, G or U)
B. Phosphate group, ribose sugar and nitrogenous base (A, C, G or T)
C. Phosphate group, deoxyribose sugar and nitrogenous base (A, T, G or U)
D. Phosphate group, deoxyribose sugar and nitrogenous base (A, C, G or T)
E. Phosphate group, deoxyribose sugar and nitrogenous base (T, C, G or U)

Directions: Each set of lettered choices below refers to the numbered statements immediately following it. Select one lettered choice that best answers each statement. A choice may be used once, more than once, or not at all in each set.

Questions 18-23:

Choose from the list of terms below:

A. Charles Darwin
B. Lamarck
C. Stephen J. Gould and Niles Eldridge
D. Oparin and Haldane
E. Hardy-Weinberg

18. Inheritance of acquired traits

19. Use and disuse

20. Theory of punctuated equilibrium

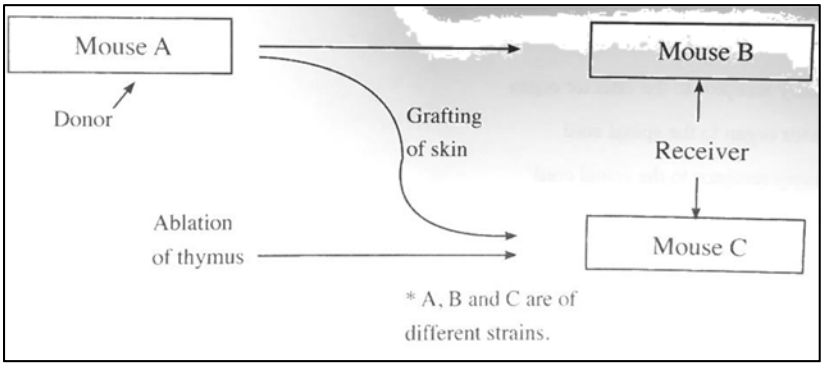
21. Populations tend to overpopulate

22. Hypothesized that under conditions that existed in early Earth, organic molecules could form

23. Survival of the fittest

Directions: In this section of the exam, each question or incomplete statement is followed by five possible answers or completions. For each of the following problems, choose the best answer from the given list of possible choices.

24. The schematic below illustrates an experiment done with mice.



In this transplantation experiment:

A. Mice B and C don't reject the graft
B. After thymus ablation mouse C loses the ability of graft rejection
C. Granulocytes are the agents of graft rejection in mouse B
D. Antibodies are capable of graft rejection in mouse C
E. The immune response responsible for graft rejection is phagocytosis in mouse B and C

25. In a dihybrid cross with independent genes present on different autosomes, the phenotypic proportion of F2 generation is:

A. 1/4- 1/4- 1/4-1/4
B. 1/2-1/2
C. 3/4 -1/4
D. 9/16- 3/16- 3/16- 1/16
E. 8/9-3/9-3/9-1/9

26. Eutrophication refers to:

A. The process that causes the depletion of the ozone layer
B. Global warming
C. The process that happens to a lake that absorbs too many nutrients
D. The invasion of new species that causes damage to an ecosystem
E. The process whereby one species outcompetes another species

27. Consider the following experiment:

Test tube	A	B	C
Content	10 ml of starch solution 1%+1 ml amylase solution	10 ml of starch solution 1%+1 ml amylase solution+ few HCl drops	10 ml of starch solution 1%+1 ml amylase solution+ few NaOH drops
Reaction with Fehling solution	+	-	-

What can you say concerning the digestion process in these tubes?

A. Digestion occurred in test tube A because amylase requires a pH near 7 to act
B. Digestion didn't occur in test tube A because the Fehling test is positive
C. Digestion occurred in test tube B because the Fehling test is negative
D. No digestion occurred in test tubes B and C because salivary amylase doesn't work on starch
E. Digestion occurred in test tubes B and C because salivary amylase work on starch

28. The best definition of a gene is that it is:

A. A sequence of amino acids which makes up a polypeptide
B. A sequence of ribonucleotides which makes up a DNA and codes for polypeptide
C. A sequence of deoxyribonucleotides which makes up the DNA and is transcribed to RNA then translated to a polypeptide
D. Any sequence of deoxyribonucleotides which makes up the DNA
E. Any sequence of ribonucleotides which makes up a DNA

29. Wildebeests separated from each other by a newly formed river are now separate species. This fact corresponds to:

A. Divergent evolution
B. Convergent evolution
C. Coevolution
D. Parallel evolution
E. Genetic drift

Directions: Each set of lettered choices below refers to the numbered statements immediately following it. Select one lettered choice that best answers each statement. A choice may be used once, more than once, or not at all in each set.

Questions 30-32:

Choose from the terms below about the nitrogen cycle

A. Nitrogen-fixing bacteria
B. Denitrifying bacteria
C. Nitrifying bacteria

30. Convert the ammonium into nitrates

31. Convert nitrates into free nitrogen in the atmosphere

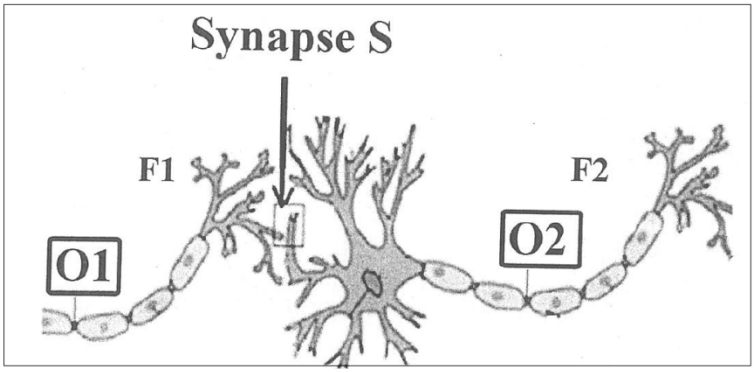
32. Convert free nitrogen from the atmosphere into the ammonium ion

Directions: In this section of the exam, each question or incomplete statement is followed by five possible answers or completions. For each of the following problems, choose the best answer from the given list of possible choices.

33. All of following are matched correctly EXCEPT:

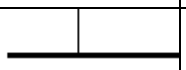
A. Gymnosperm- cone bearing
B. Ferns- seedless
C. Flowering plants- reproduce by spores
D. Bryophytes- moss
E. Dicot- peanut

34. Taste cells are sensory receptors located on the surface of the tongue. These receptors are involved in the detection of flavors. To determine the characteristics of the nerve message, a taste receptor is subjected to NaCl solutions of increasing concentrations. Two oscilloscopes O1 and O2 are connected: one, O1, to the F1 nerve fiber of the taste receptor and the other, O2, to the F2 nerve fiber of a neuron related to F1 to measure action potential (AP).



Scheme showing the experimental setup

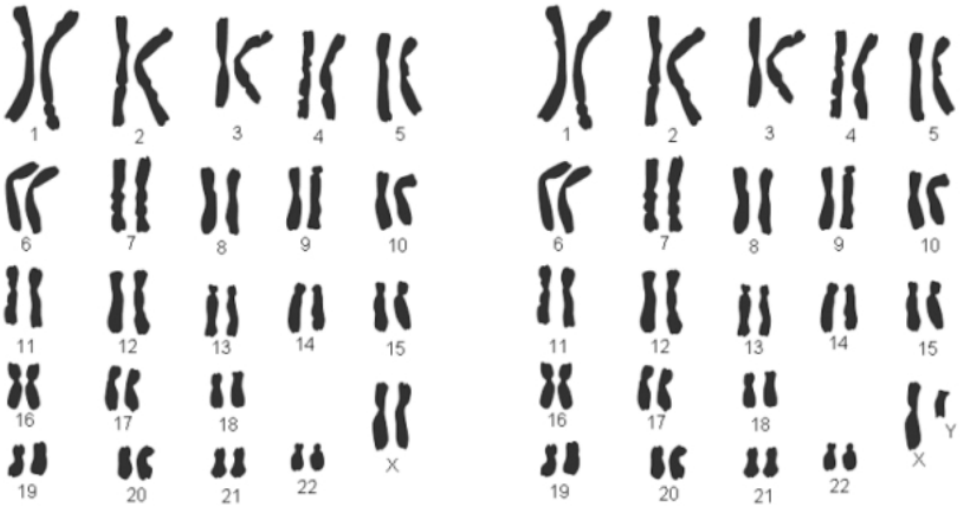
Conditions and recordings at the level of the oscilloscope O1 figure in the following table.

Concentration of NaCl solution (mmol/L)	**1**	**3**	**10**	**30**	**100**
Recordings at the level of O1					
Number of A.P	0 AP	1 AP	5 AP	9 AP	13 AP

The nervous message:

A. Is coded in frequency of action potential at the level of the nerve fiber F1
B. Is coded in amplitude of action potential at the level of the nerve fiber F1
C. Is coded in frequency and in amplitude of action potential at the level of the nerve fiber F1
D. Is transmitted from the nerve fiber F2 to the nerve fiber F1 after the stimulation of F1
E. Coding is not clear because there is insufficient data

35. A karyotype shows the number and appearance of chromosomes in the nucleus of a eukaryotic cell. Consider the following two karyotypes:



Karyotype A | **Karyotype B**

Which statement correctly reflects the gender?

A. Karyotype A belongs to a male because of the presence of XX pair
B. Karyotype B belongs to a female because of the presence of XY pair
C. Karyotype B belongs to a male because of the presence of XY pair
D. Karyotype B belongs to an abnormal female because of the presence of two chromosomes XY
E. Karyotype A belongs to an abnormal female because of the presence of two chromosomes XX

36. A DNA molecule has 20% A and 30% G. The total number of nucleotides in the DNA molecule is 20. The number of thymine nitrogenous bases in the DNA is:

A. 2
B. 3
C. 4
D. 5
E. 6

37. Darwin discovered 14 species of finches on the Galapagos Islands that all evolved from one original species of finch. This is an example of:

A. Geographic isolation
B. Polyploidy
C. Reproductive isolation
D. Adaptive radiation
E. Directional selection

Questions 38-41:

A group of students carry out an investigation on a small farm. A variety of organisms were found to live there including meadow voles, grasshoppers, spiders, birds and mice.

38. The meadow voles, grasshoppers, spiders, mice, and other organisms, along with the soil, minerals, and water make up a/an

A. Ecosystem
B. Population
C. Community
D. Food chain
E. Desert biome

39. The study of the farm revealed the population size of the different species of animals during the summer months of June, July, and August. The results are recorded in the table below.

	Number of organisms		
Species of animals	**June**	**July**	**August**
Spiders	850	300	550
Grasshoppers	1800	4600	4000
Mice	275	225	250
Birds	95	80	90

Which is correct about the data collected from June through August?

A. Only the spider population changed to any extent
B. The population of mice increased as the summer went on
C. The population of grasshoppers remained fairly constant
D. The population of birds remained fairly constant
E. Both the population of spiders and mice remained constant

40. Consider that the farmer, the owner of the farm, retired and moved away, leaving the land to grow wild. What will the students find if they come back after the field is allowed to grow wild?

A. The plants will change, but the animals will stay the same
B. The animals will change, but the plants will stay the same
C. Neither the plants nor the animals will change because the climate will not change
D. Both the animals and plants will change
E. All the animals will slowly die out because they will not be adapted to the new environment

41. Although several different species of birds inhabit the farm, competition between these birds rarely occurs. The best explanation for this lack of competition is that these birds:

A. Share food with each other
B. Have a limited supply of food
C. Live in different ecological niches
D. Are closely related
E. Have experienced mutations in their DNA that prevent them from competing

42. A cell was taken from the apical meristem of onion root tips and cultured in a suitable medium where they undergo normal cell division. Microscopic observations are continuously done and show that the time spent during metaphase is 14 min, during prophase 14 min, during interphase 642 min, during anaphase 7 min and during telophase 7 min. The number of cells produced after some time is 32 cells considering that at t0 the cells were in interphase. The time required to produce these cells is approximately:

A. 24 hours
B. 60 hours
C. 30 hours
D. 46 hours
E. 96 hours

43. In the case of pea plants, tall (T) is dominant over dwarf (t). What is the genotype of the parents of a generation of plants half of which are tall and half of which are dwarf?

A. Tt x tt
B. Tt x Tt
C. TT x tt
D. X^TX^t x X^TX^t
E. X^TX^T x X^tX^t

44. Which of the following statements best explains the fact that a mutation in a cell's DNA does not always result in an error in the polypeptide produced from that DNA sequence?

A. Some polypeptides are produced by a code other than a nucleic acid code
B. The nucleolus can repair damaged DNA
C. The Golgi body can repair damaged DNA
D. Each amino acid is coded by more than one codon
E. Scientists have no idea why this phenomenon occurs

45. A female got her first menstrual period at the age of 12. She reaches menopause at the age of 50. She gave birth to two children. The length of her menstrual cycle is 28 days and was not variable. Knowing that only one ovary is active during each menstrual cycle, calculate the number of oocytes II produced by this female.

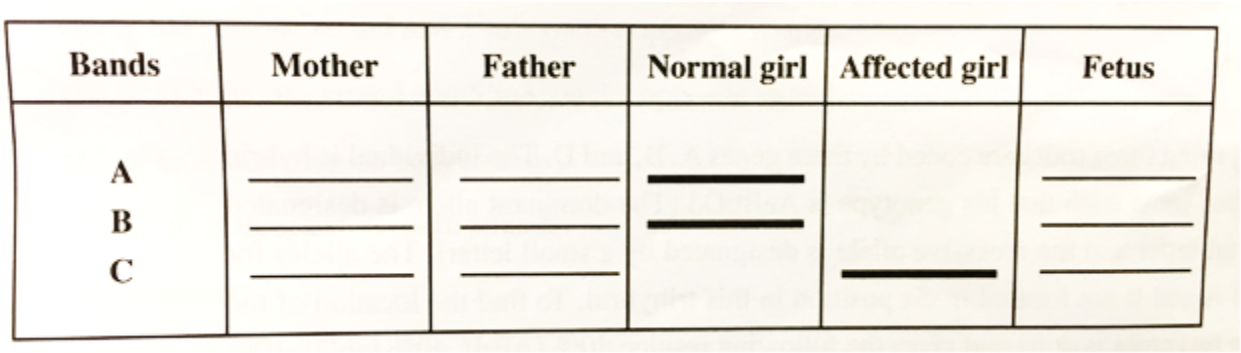
A. 495
B. 525
C. 476
D. 1944
E. 1980

46. Humans eat beef from cattle that were corn fed. Cattle and humans occupy which of the following trophic levels?

A. Producer and primary consumer
B. Primary consumer and secondary consumer
C. Secondary consumer and tertiary consumer
D. Tertiary consumer and quaternary consumer
E. Both are primary consumers

Questions 47-49:

Tay-Sachs disease is known as an infantile disease which is characterized by relentless deterioration of mental and physical abilities. It begins at 6 months of age and usually results in death by the age of five. A couple has two girls out of which one is 2 years old and has the disease. The mother got pregnant and she is afraid of having another affected child. She visited a genetic counselor who requested that a DNA analysis test be completed for the whole family. The results of the DNA analysis of all family members are shown in the following table.



Bands	Mother	Father	Normal girl	Affected girl	Fetus
A					
B					
C					

47. Based on the above given, the band(s) which correspond(s) to the:

A. Disease are bands A and C
B. Disease are bands B and C
C. Normal phenotype is band A
D. Normal phenotype are bands A and B
E. Normal phenotype are bands A and C

48. Depending on the test analysis, the fetus is:

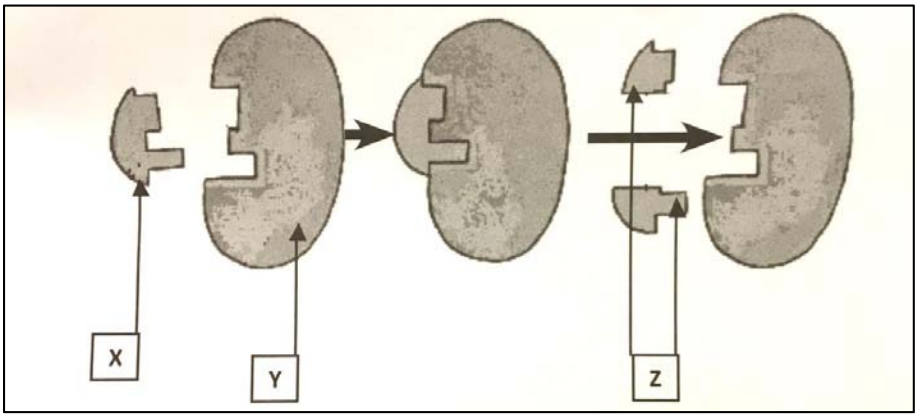
A. Of unknown genotype
B. Normal carrier of the disease
C. Normal with homozygous genotype
D. Diseased with homozygous genotype
E. Diseased with heterozygous genotype

49. The locus of the gene coding for the disease is on:

A. An autosome
B. X chromosome segment not homologous with Y
C. Y chromosome segment not homologous with X
D. Homologous segment of X and Y sex chromosomes
E. Can't be determined with this data

Questions 50-51:

The following figure represents the action of an enzyme on a substrate.



50. X, Y, and Z are respectively:

A. Enzyme, product, substrate
B. Product, enzyme, substrate
C. Substrate, enzyme, product
D. Product, substrate, enzyme
E. Enzyme, substrate, product

51. The type of reaction catalyzed by this enzyme is:

A. Synthesis reaction
B. Decomposition reaction
C. Mechanical break down
D. Neutralization reaction
E. Displacement reaction

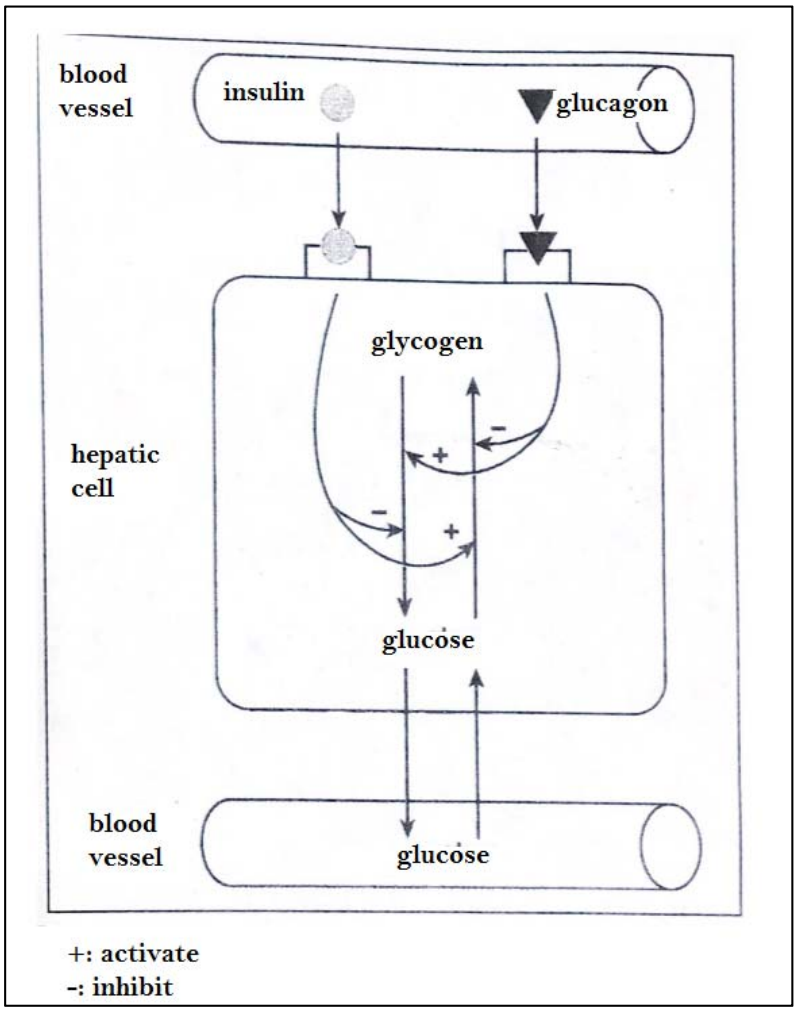
52. In a rabbit, the gene coding for the color of hair and the gene coding for the length of hair are independent. Yellow female rabbits having long hair are crossed with yellow male rabbits having long hair. The resulting offspring have the following phenotype:

90 yellow body with long hair
30 black body with long hair
30 yellow body with short hair
10 black body with short hair

The results show that:

A. There exists a lethal allele
B. It is the normal result of a self-cross where the allele for yellow is dominant over the allele for black hair and the alleles short hair and long hair are codominant alleles.
C. It is the normal result of a self-cross where the allele for black is dominant over the allele for yellow hair
D. The allele for yellow is dominant over the allele for black hair and the allele for long hair is dominant over the allele for short hair
E. The allele for yellow is dominant over the allele for black hair and the allele for short hair is dominant over the allele for long hair

53. The following figure represents the functioning mechanism of a hepatic cell of a healthy individual.



The document shows that insulin:

A. Is a hyperglycemic hormone
B. Is a hypoglycemic hormone
C. Promotes glycogenolysis
D. Decreases glycogenogenesis
E. Doesn't have any effect on glycemia

54. The document below represents the normal and the mutant DNA sequence coding for a protein.

Normal DNA sequence: TAT CAT CCT AAG GTA

Mutant DNA sequence: TAT CAT CGT AAG GTA

The mutation that affects the DNA sequence is:

A. Mutation by substitution
B. Mutation by deletion
C. Mutation by addition
D. Silent mutation due to a deletion mutation
E. Mutation by insertion

Directions: Each set of lettered choices below refers to the numbered statements immediately following it. Select one lettered choice that best answers each statement. A choice may be used once, more than once, or not at all in each set.

Questions 55-59:

Choose from the terms below:

A. CAM
B. C-4
C. G3P
D. NADP
E. ATP

55. Provides the energy for the light-independent reactions

56. A sugar synthesized during photosynthesis

57. Plants that keep their stomata closed during the day and open at night

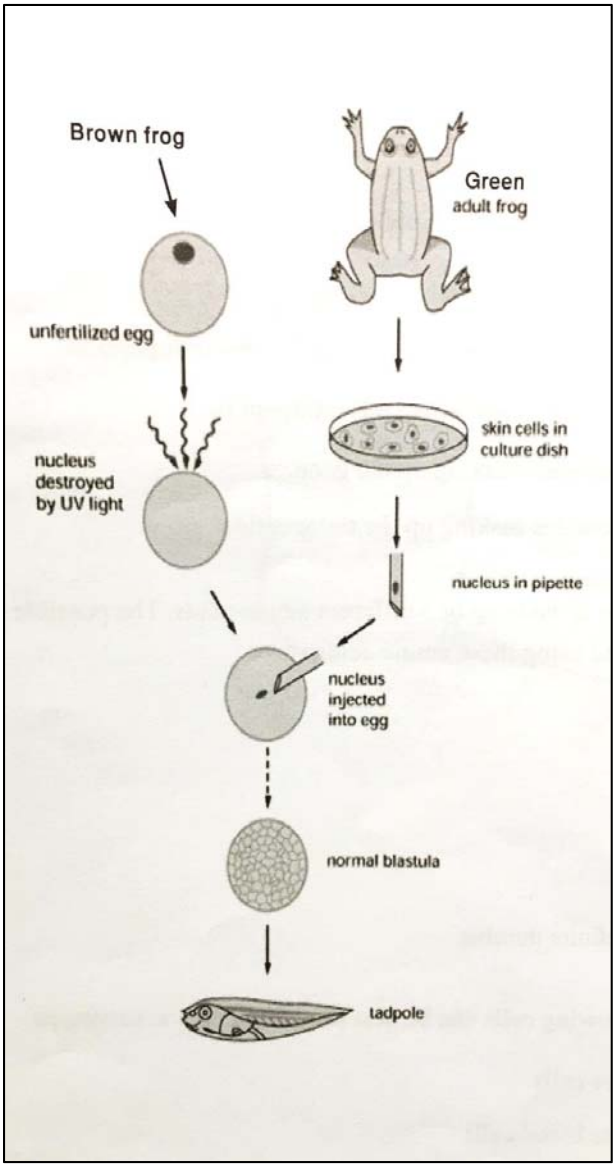
58. A molecule that caries H_2 form the light-dependent reactions and stores energized electrons temporarily to be used during the light-independent reactions

59. Plants with Kranz anatomy

Directions: In this section of the exam, each question or incomplete statement is followed by five possible answers or completions. For each of the following problems, choose the best answer from the given list of possible choices.

Questions 60-61:

Consider the following experiment:



60. The above procedure shows that the tadpole originates from:

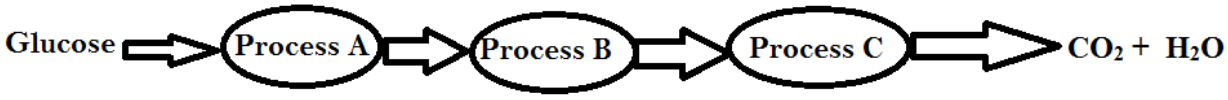
A. The skin cells of the green frog
B. The unfertilized egg of the brown frog
C. The enucleated egg of the brown frog
D. The fertilized egg having a diploid nucleus of the skin cell of the green frog
E. Recombined egg having a diploid nucleus of the skin cell of the green frog

61. The produced tadpole will grow to be a:

A. Brown frog
B. Green frog
C. Brown frog with small green dots
D. Any of the colors because its color depends on the environment
E. Green frog with small brown dots

Questions 62-66:

The three circles represent three major processes in aerobic respiration.



62. Process A represents:

A. Glycolysis
B. The Krebs cycle
C. The electron transport chain
D. Alcohol fermentation
E. Lactic acid fermentation

63. Process A occurs in:

A. Mitochondria
B. Chloroplasts
C. The nucleus
D. The cytoplasm
E. Different organelles in different cells

64. Process C represents:

A. Glycolysis
B. The Krebs cycle
C. The electron transport chain
D. Alcohol fermentation
E. Lactic acid fermentation

65. Which process (es) produce (s) the most amount of energy?

A. A
B. B
C. C
D. A and B
E. A and C

66. Which is true about process C?

A. Energy is produced by substrate level phosphorylation
B. It is universal. It is the way all organisms produce energy
C. It involves the membrane structure ATP synthetase
D. It only occurs in animals, not plants
E. It results in the by-product pyruvic acid

67. The following table shows three experiments held on 3 different mice.

Mouse	Experiments	Results
1	Mouse with a normal thyroid gland	Normal growth
2	Mouse whose thyroid gland has been removed	Stoppage of growth
3	Mouse whose thyroid gland has been removed followed by grafting at another level	The graft is rapidly vascularized, leading to normal growth of the animal.

What does the experimental results justify?

A. Thyroid gland is responsible for the growth of mice
B. Thyroid gland stops working when its location is changed
C. The communication between the thyroid and the organism isn't via blood
D. The location of the thyroid gland is important
E. Thyroid gland isn't responsible for the growth of mice

68. When humans run during a marathon, their rate of breathing increases. This is primarily controlled by:

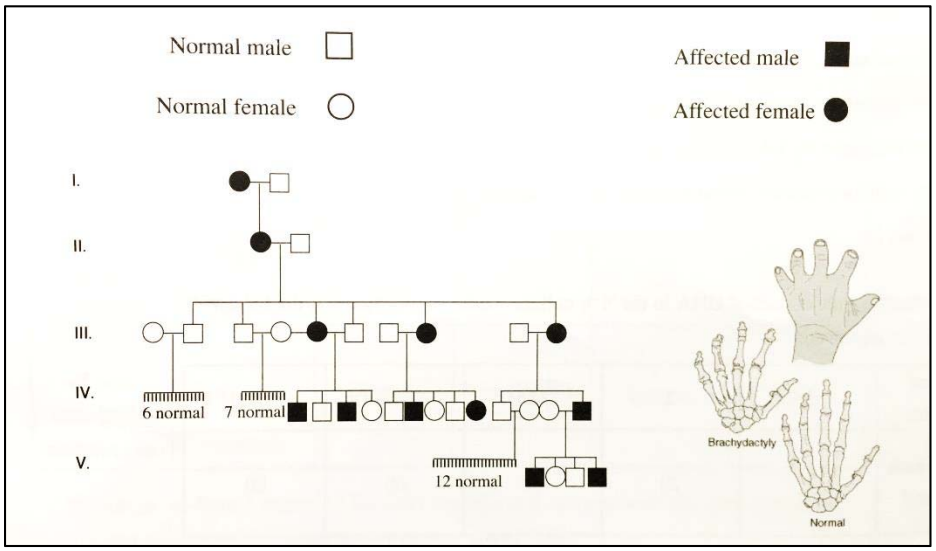
A. Lungs
B. Cerebrum
C. Medulla oblongata
D. Cerebellum
E. Pleura

69. A kind of microorganism X is cultured in a test tube on a chemical medium composed of water and mineral ions. When this tube is placed in the light and in the dark, X does not multiply. When sucrose is added to the liquid, X multiplies.

Microorganism X is:

A. photoautotroph
B. heterotroph
C. composed with chlorophyll
D. mixotrophic
E. photoautotroph or chemoautotroph

70. The following pedigree shows the transmission of the Brachydactyly (short fingers) trait in a family.



The analysis of the pedigree shows that the allele responsible for the abnormality is:

A. Dominant over the allele for normal length of the fingers
B. Recessive and dominated by the normal allele
C. Codominant with the normal allele
D. Dominant in males and recessive in females
E. Dominant in females and recessive in males

71. Fixed action patterns are initiated by external stimuli called:

A. Agonistic behavior
B. Altruistic behavior
C. Sign stimuli
D. Associative learning
E. Initial visual imprinting

72. A man who is color-blind marries a woman who has normal color vision and does not carry the trait for color blindness. What statement will be true of their children if the disease is a sex-linked disease?

A. All their sons will be normal, and all their daughters will be carriers
B. All their sons will be normal, and all their daughters will be color-blind
C. All their sons will be color-blind, and all their daughters will be normal
D. All their sons will be color-blind, and all their daughters will be carriers
E. All their daughters will be carriers, but the genotype of the sons cannot be determined

73. Which is an example of passive immunity?

A. It is lifelong
B. Babies who are nursing receive antibodies from their mothers
C. People become resistant to a viral infection once they have recovered from it
D. People become resistant to mumps after receiving the mumps vaccine
E. People who have AIDS have antibodies against the virus but are still gravely ill

74. In order to study the effect of mycorrhization on strawberry fruit production, several experiments were carried out. The table below summarizes the results of the experiments.

Experiments		**% of plants with flowers**	**Average number of flowers per plant**	**Mass of fruits (g)**
Low phosphorus soil	**Control** (Not mycorrhizal)	30%	1,3	0,2
	Mycorrhizal plant	100%	9,9	2,6
High phosphorus soil	**Control**	100%	9,4	2,2
	Mycorrhizal plant	100%	9,6	3,3

The results of this experiment show that:

A. Mycorrhization promotes flowering and strawberry productivity in a soil rich in nutrients such as phosphorus and it can even compensate for the lack of nutrients in the soil
B. Mycorrhization promotes flowering and strawberry productivity in a soil rich in nutrients such as phosphorus but it can't compensate for the lack of nutrients in the soil
C. Mycorrhization doesn't promote flowering and strawberry productivity in a soil rich in nutrients such as phosphorus but it can compensate for the lack of nutrients in the soil
D. Mycorrhization doesn't promote flowering and strawberry productivity in a soil rich in nutrients such as phosphorus and it can't compensate for the lack of nutrients in the soil
E. Mycorrhization doesn't have any benefits, it's all about the soils' nature

75. Konrad Lorenz investigated a learning mechanism. He explains that it's a learning that occurs during sensitive or critical periods in early life and it cannot be reversed. This is considered as:

A. Habituation
B. Operant conditioning
C. Trial and error learning
D. Imprinting
E. Classical conditioning

76. A black animal is crossed with a white animal and all the offspring are black. Which pattern of inheritance is at work?

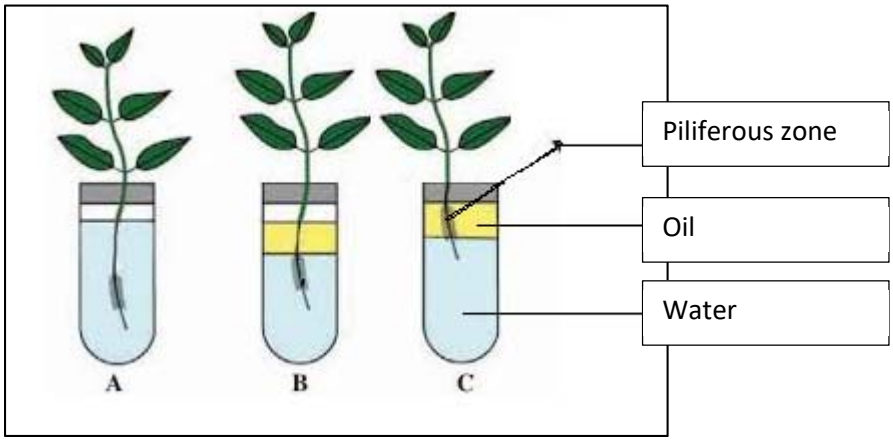
A. Law of dominance
B. Law of segregation
C. Incomplete dominance
D. Codominance
E. Sex-linked inheritance

77. When an animal sheds its exoskeleton, it will be vulnerable to predation. Which of the following correctly identifies an advantage of an internal skeleton over an external skeleton?

A. An internal skeleton supports the animal better
B. An external skeleton can dissolve easily in wet climates
C. An external skeleton doesn't grow with the animal's body
D. The internal skeleton prevents infections better than an external one
E. Animals with external skeletons are not as successful as animals with internal skeletons

Questions 78-80:

The root of many terrestrial plant species includes several areas. At the vicinity of the root extremity, numerous extensions exist: the root hairs forming the piliferous layer. The following experiment was performed.



78. The problem tested in this experiment is:

A. Which area of the root is responsible for water absorption?
B. Which area of the root is responsible for oil absorption?
C. What is the importance of oil to the plant?
D. What is the importance of water to the plant?
E. What is the importance of leaves in absorption?

79. After 15 days, the obtained results of this experiment will be:

A. Survival of the plants in the three tubes A, B and C
B. Survival of the plants in tube A and B
C. Survival of the plants in tube A and C
D. Survival of the plants in tube A only
E. Survival of the plants in tube B and C

80. What will the result of the iodine test carried on the leaves be if these three tubes were placed in the dark?

A. Appearance of blue color on leaves of the plant in tube A only
B. Appearance of blue color on leaves of the plant in tube A and B
C. Appearance of blue color on leaves of the plant in tube B and C
D. Appearance of blue color on leaves of the plant in tubes A, B and C
E. No blue color will be detected on any of the leaves of the three plants