1. Which of the following characteristics is used to distinguish insects from other arthropods?

(A) Number of legs
(B) Hairiness
(C) Colour
(D) Shape

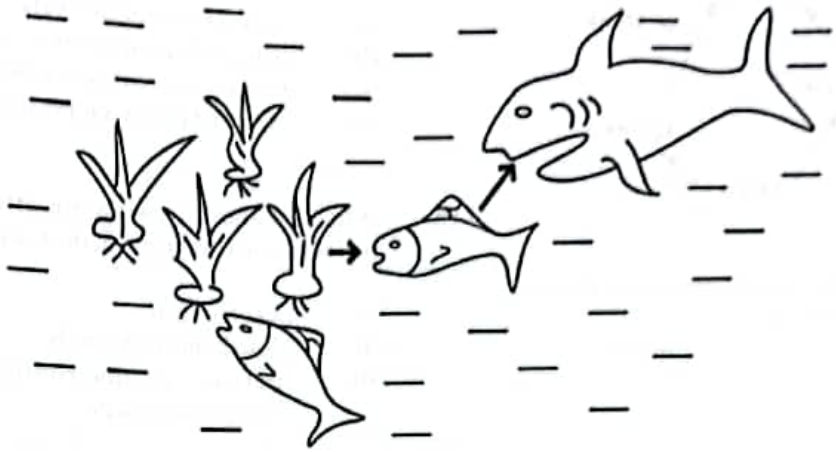
2. Which of the following organisms can be collected using a line transect?

(A) Decaying leaves and grass
(B) Insects and some types of plants
(C) Fast-moving organisms and plants
(D) Slow-moving organisms and plants

3. A 50 g sample of fresh soil is repeatedly heated at 110 °C and cooled in a desiccator. The final constant weight of the soil is 35 g. The soil component eliminated by this procedure is MOST likely

(A) air
(B) water
(C) humus
(D) mineral

Item 4 refers to the following illustration of a feeding relationship.



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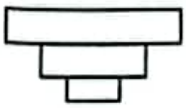
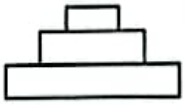
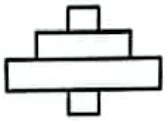
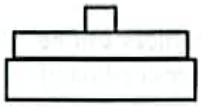
4. Which of the following pyramids of numbers BEST represents the feeding relationship shown above?

(A) 

(B) 

(C) 

(D) 

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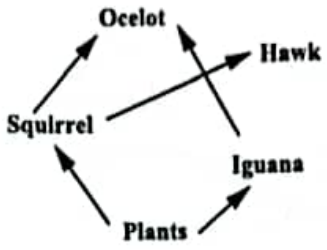
5. Infestations of mealy bugs can cause severe damage to hibiscus plants and very often ladybird beetles are introduced to reduce the mealy bug population.

The relationship between the mealy bugs and ladybird beetles can be described as

(A) parasitism
(B) mutualism
(C) prey/predator
(D) commensalism

Item 6 refers to the following food web.



6. How many food chains are there in the food web shown above?

(A) 1
(B) 2
(C) 3
(D) 4

7. In a food chain, the GREATEST amount of energy flows through the

(A) producers
(B) herbivores
(C) carnivores
(D) decomposers

8. Which of the following practices can be used in the conservation or restoration of an ecosystem?

I. Restricted hunting seasons
II. Quarrying to remove limestone
III. Planting of mangrove along the shoreline

(A) I only
(B) II only
(C) I and III only
(D) I, II and III

9. The GREATEST threat to the survival of coral reefs is

(A) decreased nitrogen levels
(B) increased dissolved oxygen
(C) decreased greenhouse gases
(D) increased ocean temperatures

10. Which of the following are effects of pollutants on coral reefs in the Caribbean?

I. Less reef fish
II. More branching corals
III. Increase in macroalgal and seagrass growth

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

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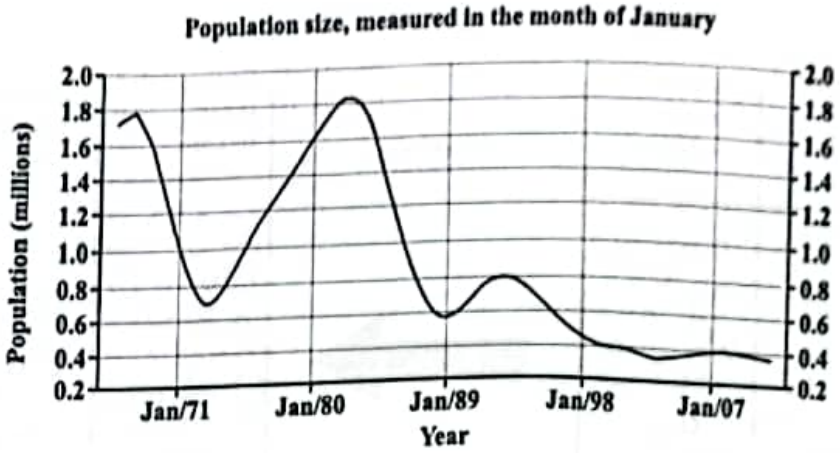
Item 11 refers to the following diagram of human population size over a period of time.



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11. Which of the following factors MOST likely account for the change in population size from January 1980 to January 1989?

I. Increase in contraceptive use
II. Influenza disease
III. Decrease in fatal crimes

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

12. Which of the following organelles is directly involved in photosynthesis?

(A) Mitochondrion
(B) Chloroplast
(C) Cytoplasm
(D) Nucleus

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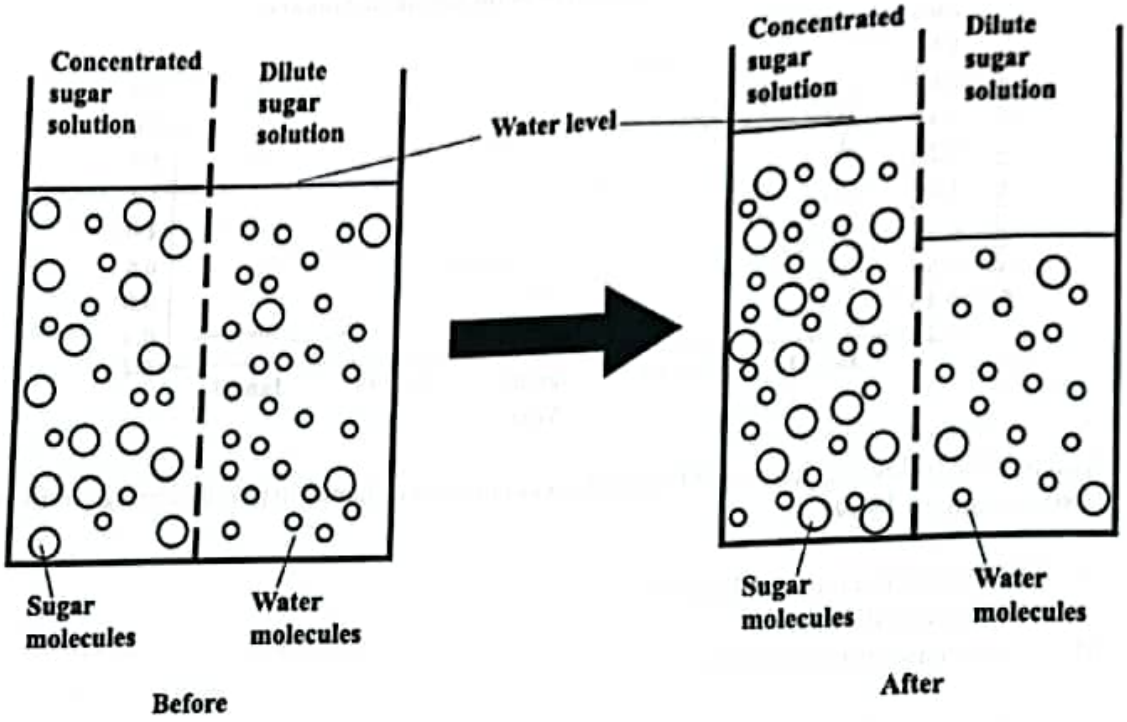
13. Which of the following comparisons of the cell wall and the cell membrane is INCORRECT?

	Cell Wall	Cell Membrane
(A)	Found in plant cells only	Found in both plant and animal cells
(B)	Freely permeable	Differentially permeable
(C)	Contains cellulose	Does not contain cellulose
(D)	Found in both plant and animal cells	Found in animal cells only

Item 14 refers to the following diagram which shows a process by which substances are moved into and out of cells.



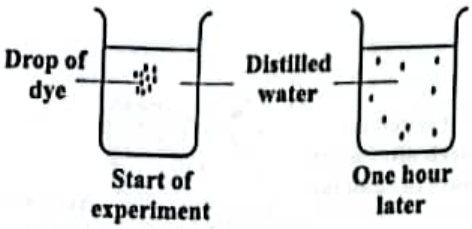
14. Which of the following correctly identifies and describes the process occurring in the diagram shown above?

	Process	Description
(A)	Diffusion	Water moving from concentrated to dilute solution
(B)	Osmosis	Water moving from dilute to concentrated solution
(C)	Diffusion	Sugar moving from dilute to concentrated solution
(D)	Osmosis	Sugar moving from concentrated to dilute solution

15. In multicellular organisms, cells become different from one another in order to carry out particular functions. This is called

(A) selection
(B) evolution
(C) adaptation
(D) specialization

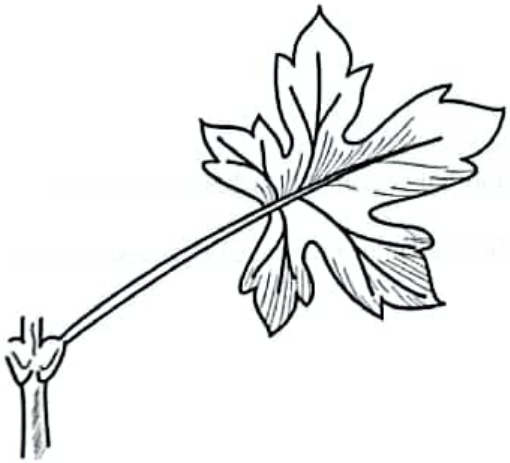
Item 16 refers to the following diagrams which illustrate the result of an experiment.



16. The process demonstrated in the diagrams above is responsible for

(A) water entering root cells
(B) minerals entering root cells
(C) starch entering phloem cells
(D) carbon dioxide entering leaf cells

Item 17 refers to the following diagram which shows the external structure of a leaf.



17. What visible characteristics of the leaf allow it to carry out photosynthesis effectively?

(A) Green, small surface area, network of veins
(B) Held upright, large surface area, network of veins
(C) Held upright, large surface area, many palisade cells
(D) Many stomata, large air spaces, palisade cells with many chloroplasts

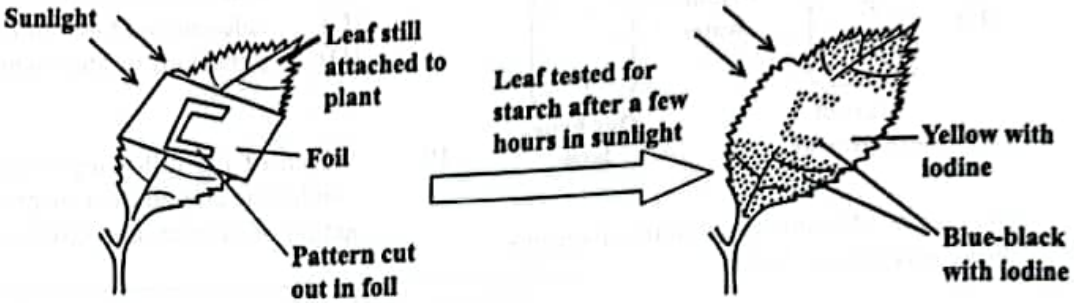
18. Anaemia may be caused by a lack of

(A) iron and vitamin B
(B) iodine and vitamin C
(C) calcium and vitamin D
(D) phosphorous and vitamin A

19. Which of the following combinations of conditions and amount of product for the action of salivary amylase is optimum?

	Temperature (°C)	pH	Amount of Maltose Produced (µg)
(A)	20–30	1–2	12
(B)	30–40	7–8	73
(C)	30–40	9–10	64
(D)	40–50	7–8	32

Item 20 refers to the following diagram which illustrates the result of an investigation on a well-watered, de-starched plant which was left for a few hours in sunlight.



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20. A likely explanation of this result is that the

(A) covered part of the leaf died
(B) soil around the plant dried out
(C) foil prevented light from entering the leaf
(D) foil prevented carbon dioxide from entering the leaf

21. The role of an enzyme is BEST described as

(A) increasing the rate of a chemical reaction
(B) decreasing the rate of a chemical reaction
(C) decreasing the rate of a chemical reaction but remaining unchanged at the end of the reaction
(D) increasing the rate of a chemical reaction but remaining unchanged at the end of the reaction

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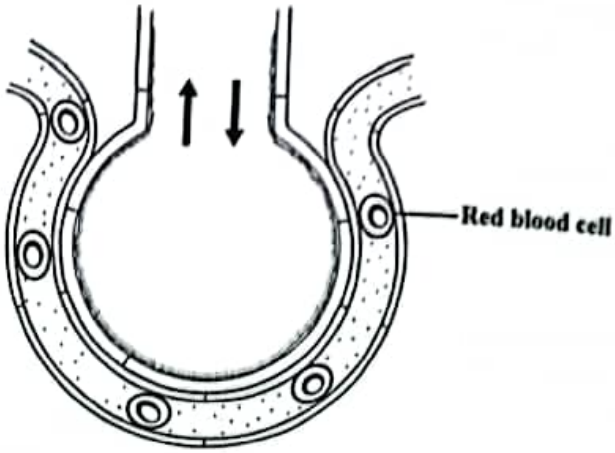
Item 22 refers to the following diagram of a respiratory structure.



22. The respiratory structure shown above is

(A) an alveolus
(B) a trachea
(C) a bronchiole
(D) a gill filament

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23. An athlete suffered muscle cramps following his race. The muscle cramps are MOST likely caused by an accumulation of

(A) urea
(B) oxygen
(C) lactic acid
(D) excess glucose

24. Which of the following activities regarding the process of ventilation in the lungs is NOT correct?

(A) Air moves into lungs.
(B) Ribs move down and in.
(C) Diaphragm muscles flatten.
(D) Volume of thoracic cavity increases.

25. Artificial immunity can BEST be described as immunity

(A) produced by deliberate exposure to a pathogen
(B) that has been passed on from the mother's colostrum
(C) acquired from the body's natural defence against disease
(D) that has been passed on from mother to child in the uterus

26. Which of the following is NOT a type of substance transported by the circulatory system of an animal?

(A) Solid undigested food
(B) Metabolic waste
(C) Respiratory gas
(D) Digested food

27. The blood of a person suffering from a pathogenic disease differs from that of a healthy person because it has a larger number of

(A) platelets
(B) red blood cells
(C) sugar molecules
(D) white blood cells

28. Which of the following statements correctly describes the xylem of a flowering plant?

(A) It has lignified walls for support.
(B) It transports water and manufactured food.
(C) Its mitochondria releases energy for the movement of materials.
(D) The presence of end walls prevents materials from being lost to the atmosphere.

29. Which of the following features correctly distinguishes a phagocyte from a lymphocyte?

	Feature	Phagocyte	Lymphocyte
(A)	Engulfs pathogens	Yes	No
(B)	Produces antibodies	Yes	No
(C)	Has a lobed nucleus	No	Yes
(D)	Formed in bone marrow	Yes	Yes

30. A person whose kidneys have failed must undergo a process by which excretory materials are removed from the blood regularly. This is because excretory materials

(A) raise blood pressure
(B) make the blood dilute
(C) are not gotten rid of by any other means
(D) would otherwise accumulate and poison the person

31. Which of the following processes is responsible for the removal of undigested food from the body?

(A) Egestion
(B) Excretion
(C) Digestion
(D) Mastication

32. A student eats a highly salted snack and does not drink water. Which of the following options describes and explains the urine MOST likely produced after a few hours?

	Type of Urine	ADH	Water Absorption by Kidney
(A)	Dilute	Released	Absorbed
(B)	Dilute	Not released	Not absorbed
(C)	Concentrated	Released	Absorbed
(D)	Concentrated	Not released	Not absorbed

33. Which of the following correctly describes movement in plants?

(A) Irreversible, whole movement
(B) Reversible, whole movement
(C) Irreversible, growth movement
(D) Reversible, growth movement

34. Which of the following statements about the skeletal system is NOT correct?

(A) It protects delicate organs such as the heart and lungs.
(B) It is made up of hard non-living tissues.
(C) It produces red and white blood cells.
(D) It gives the body its shape.

35. For which of the following reasons is locomotion important to animals?

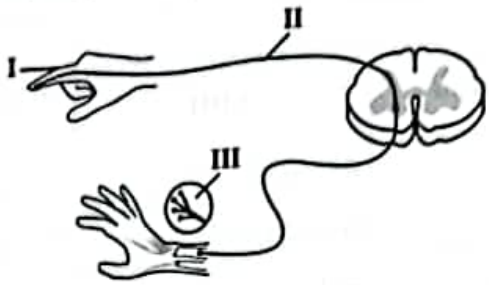
I. Avoiding predators
II. Acquiring food and shelter
III. Assimilating digested food

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

36. A detectable change in the internal or external environment of an organism is called

(A) a stimulus
(B) a response
(C) a receptor
(D) an effector

Item 37 refers to the following diagram.



37. Which of the following options correctly identifies the structures labelled I, II and III?

	I	II	III
(A)	Sensory nerve	Spinal nerve	Effector
(B)	Receptor	Sensory neuron	Motor neuron
(C)	Skin	Intermediate nerve	Muscle
(D)	Receptor	Spinal nerve	Effector

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Item 38 refers to the following actions.

I. Bending of shoots towards light
II. Rolling up of a millipede when touched
III. Withdrawal of an earthworm into its burrow when touched

38. All of the actions are examples of

(A) stimuli
(B) responses
(C) locomotion
(D) growth movements

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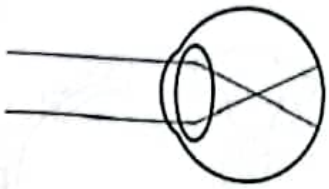
39. A girl smells a hamburger that is being cooked by her mother and she salivates. Which of the following is the effector which brings about her response?

(A) Secretion of saliva
(B) Cells in the nose
(C) Salivary glands
(D) Smell of food

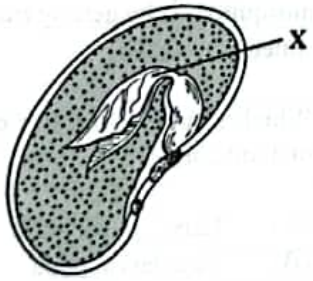
Item 40 refers to the following diagram showing nearsightedness in an eye.



40. Which of the following shows how the defect can be corrected?

	Lens	Bending of Light Rays Before Entering the Eye
(A)	Diverging	Outwards
(B)	Diverging	Inwards
(C)	Converging	Outwards
(D)	Converging	Inwards

Item 41 refers to the following diagram of a dicotyledonous seed.



41. The structure labelled X is the

(A) hilum
(B) radicle
(C) plumule
(D) micropyle

42. The following statements describe the processes taking place within a seed during germination.

I. The embryo uses food to develop the radicle and plumule.
II. Enzymes break down proteins into amino acids.
III. Soluble products move into the embryo.

Which of the following correctly identifies the sequence of events during the germination of the seed?

(A) I → II → III
(B) I → III → II
(C) II → I → III
(D) II → III → I

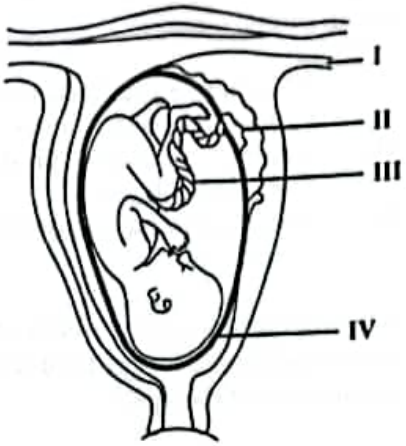
43. One advantage that sexual reproduction has over asexual reproduction is that sexual reproduction

(A) is conservative
(B) leads to variation
(C) produces disease-resistant crops
(D) produces greater numbers of offspring

44. Pollen grains which are small, light, odourless and smooth are MOST likely transferred by

(A) water
(B) birds
(C) wind
(D) insects

Item 45 refers to the following diagram.



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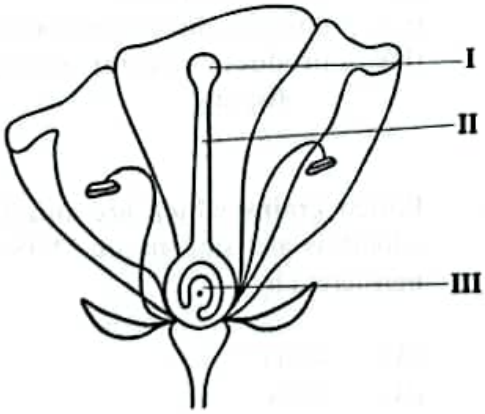
45. The amnion is labelled

(A) I
(B) II
(C) III
(D) IV

Item 46 refers to the following figure of a flower with its parts labelled I, II and III.



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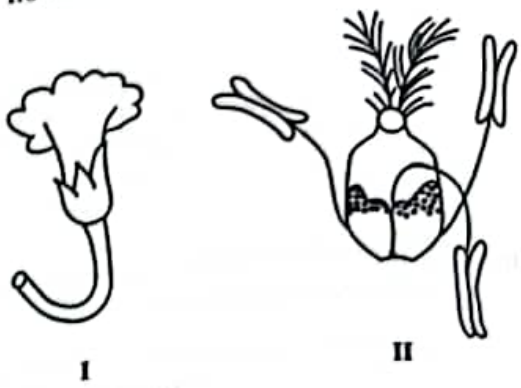
46. The collective term used to describe the labelled parts is

(A) calyx
(B) carpel
(C) corona
(D) corolla

Item 47 refers to the following diagrams of flowers from two different types of plants.



47. Which of the following statements is true for both flowers?

(A) Both are wind pollinated.
(B) Petals are absent from both I and II.
(C) Both are pollinated by a hummingbird.
(D) I is pollinated by a hummingbird; II is pollinated by the wind.

48. One method of controlling the population of mosquitoes is by getting rid of all stagnant water.

Which stages of the life cycle does this method control?

(A) Larva, pupa, adult
(B) Egg, larva, pupa
(C) Egg, larva, adult
(D) Egg, pupa, adult

49. Which of the following may be caused by pathogens?

(A) Anaemia
(B) Heart disease
(C) Physical addiction
(D) Communicable disease

50. A farmer's crop is infected by a disease-causing organism and he is unable to harvest most of the crop. Which of the following is an **environmental** implication of this infection?

(A) Loss of crop
(B) Loss of productivity
(C) Loss of income and profit
(D) Risk of spread of the disease to nearby farmers' crops

51. Which of the following options correctly describes DNA, chromosome, gene and allele?

	DNA	Chromosome	Gene	Allele
(A)	Deoxyribonucleic acid	DNA + histamine	Unit that codes for a specific protein	An alternate form of a gene
(B)	Unit that codes for a specific protein	An alternate form of a gene	DNA + protein	Histones
(C)	Nucleic acid that has all genetic information	DNA + histones	The smallest unit of inheritance	An alternate form of a gene
(D)	Nucleic acid that has all genetic information	The smallest unit of inheritance	Unit that codes for a specific protein	DNA + protein

52. The gene for coat colour in cattle shows incomplete dominance. A purebred cow with red coat mates with a purebred bull with white coat. All of the offspring have roan coats. Which of the following would represent the genotype of the offspring?

(A) RR
(B) RW
(C) RO
(D) WW

53. A man with blood group A married a woman with blood group B. They had two children with blood group AB. The alleles A and B are described as being

(A) homozygous
(B) codominant
(C) recessive
(D) dominant

54. Which of the following features of cell division refers to mitosis?

(A) It is essential for variety within a species.
(B) It results in the haploid number of chromosomes.
(C) It takes place in reproductive structures.
(D) The amount of genetic material in the cells remains the same.

55. Which of the following statements about meiosis is NOT true?

(A) It allows for genetic variation.
(B) It results in the production of gametes.
(C) It causes haploid cells to form from diploid cells.
(D) It doubles the number of chromosomes in gametes.

56. Albinism is caused by a single recessive allele. Two normal parents have an albino child. This is because

(A) both parents were heterozygous for the gene
(B) both parents were homozygous recessive for the gene
(C) one parent was homozygous dominant for the trait and the other heterozygous
(D) one parent was homozygous dominant for the trait and the other homozygous recessive

57. Variation in populations is due to

I. mutation
II. crossing over
III. asexual reproduction

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

58. Which of the following are ways in which new species may be formed?

I. Extinction
II. Physical separation
III. Ecological differentiation

(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

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59. Which of the following is true about natural and artificial selection?

	Natural Selection	Artificial Selection
(A)	Occurs in domestic populations	Occurs in natural populations
(B)	Involves genetic modification	Largely controlled by the environment
(C)	Produces organisms well adapted to natural habitats	Produces organisms with desirable traits/characteristics
(D)	Faster process	Slower process

60. Which of the following does NOT apply to genetic engineering?

(A) Treating genetic diseases
(B) Producing higher yielding crops
(C) Producing hormones and proteins
(D) Determining the parentage of a child

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.