



CANDIDATE – PLEASE NOTE!

PRINT your name on the line below and return this booklet with the answer sheet. Failure to do so may result in disqualification.

FORM TP 2016001

TEST CODE **01207010**

JANUARY 2016

**CARIBBEAN EXAMINATIONS COUNCIL
CARIBBEAN SECONDARY EDUCATION CERTIFICATE®
EXAMINATION
BIOLOGY**

Paper 01 – General Proficiency

1 hour 15 minutes

19 JANUARY 2016 (a.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This test consists of 60 items. You will have 1 hour and 15 minutes to answer them.
2. In addition to this test booklet, you should have an answer sheet.
3. Each item in this test has four suggested answers lettered (A), (B), (C), (D). Read each item you are about to answer and decide which choice is best.
4. On your answer sheet, find the number which corresponds to your item and shade the space having the same letter as the answer you have chosen. Look at the sample item below.

Sample Item

Which of the following diseases is due to a dietary deficiency?

- (A) Malaria
- (B) Diabetes
- (C) Influenza
- (D) Anaemia

Sample Answer



The best answer to this item is “Anaemia”, so (D) has been shaded.

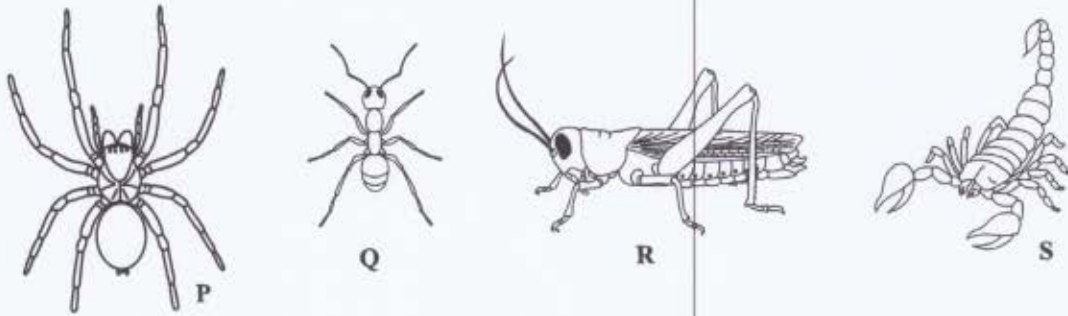
5. If you want to change your answer, erase it completely and fill in your new choice.
6. When you are told to begin, turn the page and work as quickly and as carefully as you can. If you cannot answer an item, go on to the next one. You may return to that item later.
7. Figures are not necessarily drawn to scale.

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



16009

Item 1 refers to the following diagram, which shows organisms P, Q, R and S collected in an ecological study of an abandoned plot.



1. The organisms that can be placed in the same group are

- (A) P and Q
- (B) R and S
- (C) P and R
- (D) P and S

2. Which of the following is a biotic factor?

- (A) Light intensity
- (B) Salinity level
- (C) Competition for food
- (D) Carbon dioxide concentration

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

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

Item 4 refers to the following food chain, typically found in a pond.

Algae → waterflea → fish → heron (bird)

4. Which of the following correctly matches the organism with its trophic level?

	Organism	Trophic Level
(A)	Algae	Producer
(B)	Heron	Primary consumer
(C)	Waterflea	Secondary consumer
(D)	Fish	Tertiary consumer

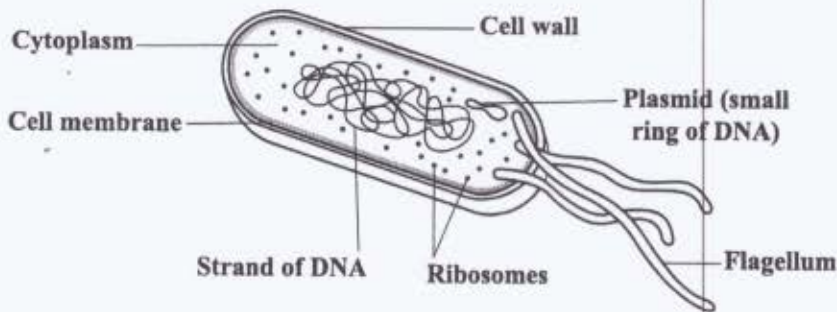
5. Which of the following are true of decomposers?

- I. They cause decay.
- II. They recycle minerals.
- III. They are organic feeders.
- IV. They do not respire.

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

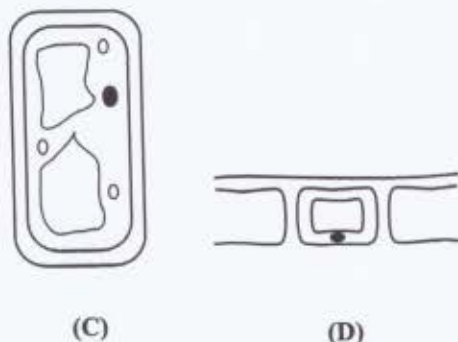
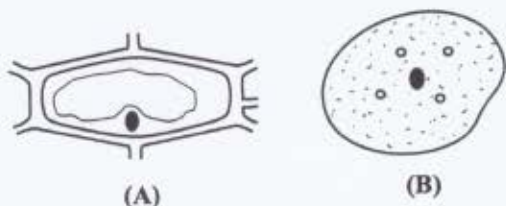
6. In a food chain, the GREATEST amount of energy flows through the
- (A) carnivores
 - (B) decomposers
 - (C) herbivores
 - (D) producers
7. In the carbon cycle, the organisms responsible for removing carbon dioxide from the atmosphere are
- (A) producers
 - (B) decomposers
 - (C) consumers
 - (D) parasites
8. Which of the following is the BEST reason for using a natural fertilizer?
- (A) It improves the structure of the soil.
 - (B) It lasts for a long period of time.
 - (C) The amount of each nutrient varies.
 - (D) It releases nutrients slowly.
9. Which of the following is an abiotic factor which can restrict the size and growth of a population of rabbits in the wild?
- (A) Increased numbers of sheep
 - (B) Presence of predators
 - (C) Rapid outbreak of diseases
 - (D) Low nutrient levels in the soil

Item 10 refers to the following diagram of a cell.



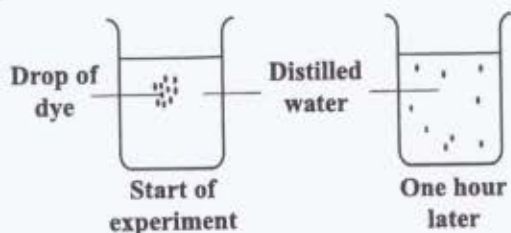
10. The diagram above MOST likely represents
- (A) a virus
 - (B) a fungus
 - (C) a bacterium
 - (D) an *amoeba*

Item 11 refers to the following diagrams of cells.



11. Which of the above MOST likely represents an animal cell?

Item 12 refers to the following diagrams which illustrate the result of an investigation.

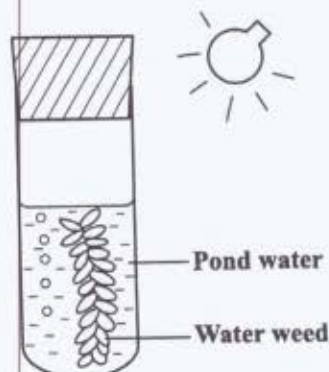


12. The process demonstrated in the diagrams above is responsible for
- (A) water entering root cells
 - (B) minerals entering root cells
 - (C) starch entering phloem cells
 - (D) carbon dioxide entering leaf cells

13. Which of the following organisms are autotrophs?

- (A) Cows
- (B) Moulds
- (C) Humans
- (D) Seaweeds

Item 14 refers to the following diagram.



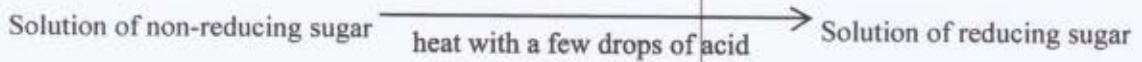
14. If the bubbles given off by the plants were collected and tested, the gas present would MOST likely be

- (A) hydrogen
- (B) oxygen
- (C) nitrogen
- (D) carbon dioxide

15. Which of the following structures are found in the upper epidermis of a leaf?

- I. A cuticle
 - II. Many air spaces
 - III. Closely-packed cells
- (A) I and II only
 - (B) I and III only
 - (C) II and III only
 - (D) I, II and III

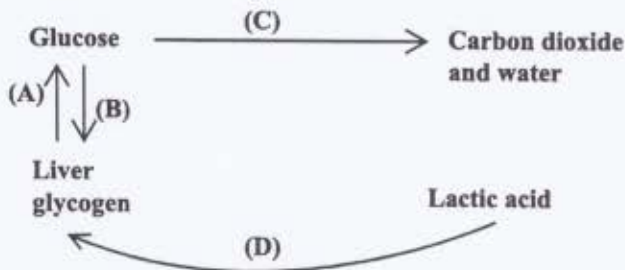
Item 16 refers to the following reaction.



16. The process involved in the reaction shown above is

- (A) condensation
- (B) digestion
- (C) emulsification
- (D) hydrolysis

Item 17 refers to the following diagram which shows the glucose-glycogen balance in humans.

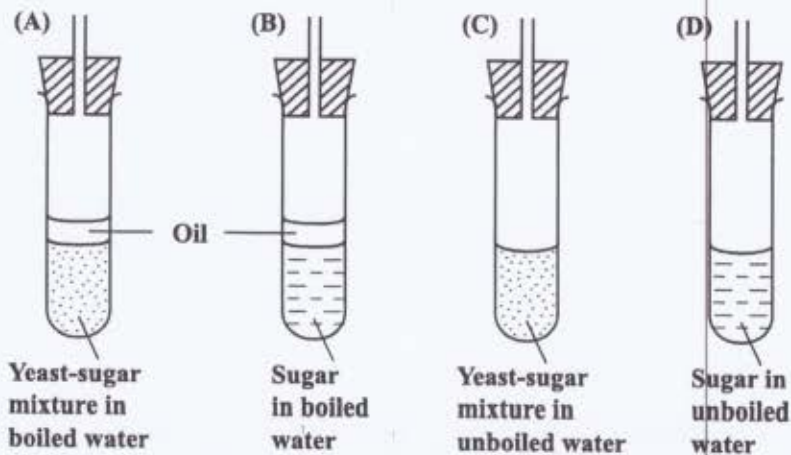


17. Where in the cycle would the hormone insulin be needed?

18. Anaemia may be caused by a lack of

- (A) iron and Vitamin B
- (B) calcium and Vitamin D
- (C) iodine and Vitamin C
- (D) phosphorous and Vitamin A

19. The following apparatus was set up to demonstrate respiration by yeast cells. In which set of apparatus would **aerobic** respiration occur?



20. 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

21. Which of the following is NOT a type of substance carried by the transport system in an animal?

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

22. The blood vessel that supplies blood to the brain is the

- (A) vena cava
- (B) carotid artery
- (C) hepatic vein
- (D) pulmonary artery

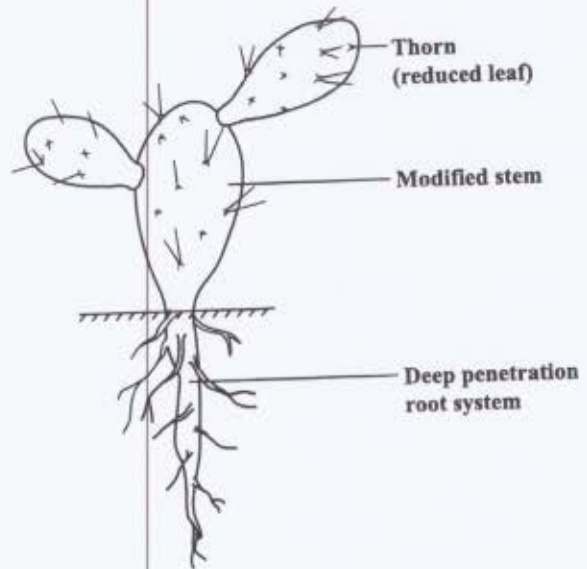
23. The blood of a person suffering from a pathogenic disease differs from that of a healthy person by having a larger number of

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

24. 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 release energy for movement of materials.
- (D) The presence of end walls prevents materials from being lost to the atmosphere.

Item 25 refers to the following diagram of a cactus.



25. Which of the following BEST describes the function of the thorns?

- (A) Aid in dispersal
- (B) Increase surface area
- (C) Reduce transpiration
- (D) Ward off herbivores

Items 26–27 refer to the information in the following table.

Vessel	Feature		
	Offers Support	Transports Water	Transports Sugar Solution
(A)	x	x	√
(B)	√	√	x
(C)	√	x	√
(D)	x	√	√

In answering Items 26–27, match each item with one of the options above. Each option may be used once, more than once or not at all.

26. Sieve tube

27. Xylem vessel

28. Onions store food mainly in their

- (A) roots
- (B) seeds
- (C) stems
- (D) leaves

29. 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 concentrated
- (C) are not gotten rid of by any other means
- (D) would otherwise accumulate and poison the person

30. The ureter carries urine from the

- (A) kidney to the bladder
- (B) bladder out of the body
- (C) collecting tubule to the pelvis
- (D) nephron to the collecting tubule

31. Which of the following is LEAST likely to be an example of a growth movement in a plant?

- (A) The closing of the leaves of a sensitive plant
- (B) The downward movement of the roots in the soil
- (C) The crawling movement of runners like grasses
- (D) The upward movement of a vine on a rod

32. Which type of joint is found at the elbow?

- (A) Pivot
- (B) Hinge
- (C) Gliding
- (D) Ball and socket

33. Invertebrates move from lit areas to dark areas to prevent

- (A) desiccation (drying out)
- (B) being captured by predators
- (C) their prey from seeing them
- (D) their enzymes being denatured

34. Living organisms are affected by changes in the environment. Which of the following play a part in detecting changes?

- (A) Synapses
- (B) Sensory cells
- (C) Motor neurones
- (D) Neurotransmitters

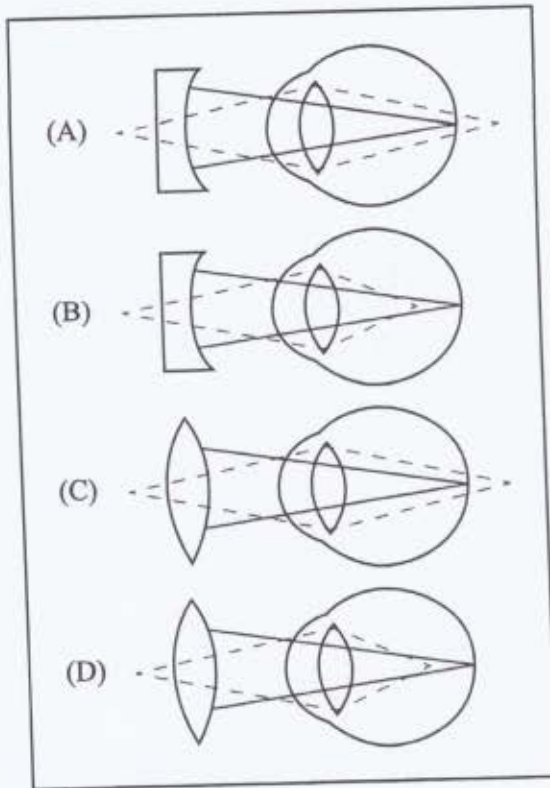
35. Which of the following is NOT correctly matched?

	Part of Brain	Function
(A)	Cerebrum	Centre controlling conscious thought
(B)	Cerebellum	Balance and muscle coordination centre
(C)	Hypothalamus	Homeostatic control centre
(D)	Medulla oblongata	Consciousness and memory centre

36. Which of the following is a short-term effect of excessive alcohol consumption?

- (A) Feeling cold, then hot
- (B) Reduced need to sleep
- (C) Increased blood pressure
- (D) Increased urination leading to dehydration

37. Which of the following diagrams shows the correction for short sightedness?



38. Which of the following skin structures would be involved in temperature control?

- I. Sweat glands
- II. Capillaries
- III. Fat deposits

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

Item 39 refers to the following simple experiment carried out by a student to investigate growth in corn seedlings. After three days the results were as follows:

Corn Seedling	1	2	3	4	5
Initial height (cm)	2.5	2.0	1.9	2.1	2.0
Height after three days (cm)	5.0	4.2	4.0	3.5	4.5

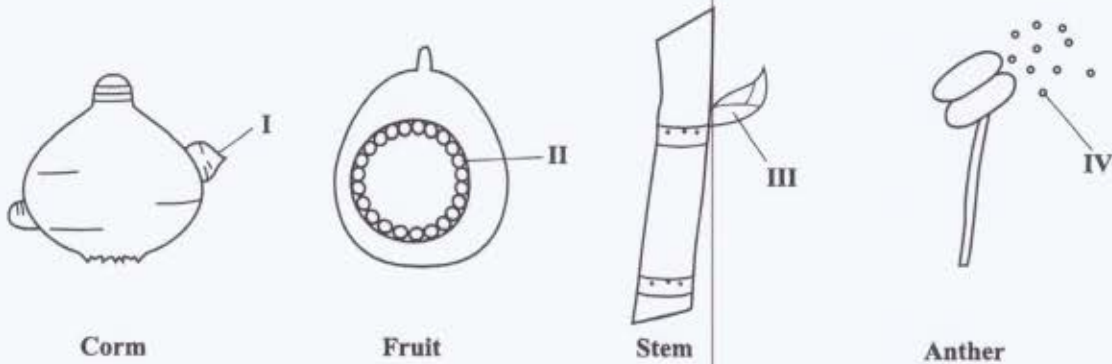
39. What is the average growth, in cm, of the corn seedlings during the three days?

- (A) 2.00
- (B) 2.14
- (C) 2.50
- (D) 2.75

40. Which of the following is NOT necessary for germination of all seeds?

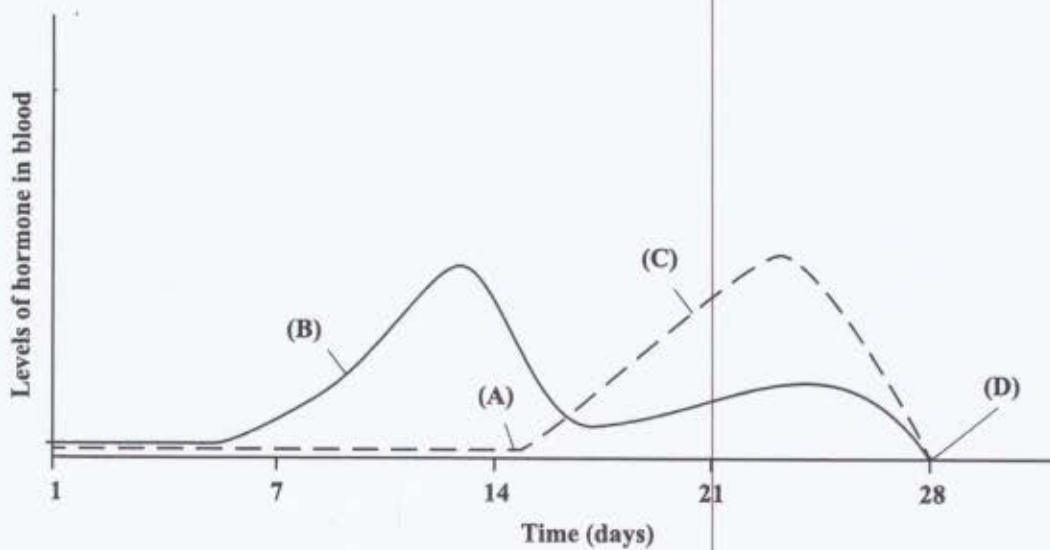
- (A) Light
- (B) Oxygen
- (C) Moisture
- (D) Food supply

Item 41 refers to the reproductive structures labelled I, II, III and IV which are found on the plant parts identified.



41. Which of these structures are genetically identical to the parents?
- (A) I and II only
 - (B) I and III only
 - (C) II and III only
 - (D) II, III and IV only

Items 42–43 refer to the graphs of oestrogen and progesterone levels in the blood over a period of one month.



42. At which point is the uterine lining being repaired?
43. At which point is ovulation occurring?

44. A flower which blooms at night and has white petals is MOST likely pollinated by

- (A) bats
- (B) wind
- (C) birds
- (D) insects

45. The transfer of pollen from the anther of one flower to the stigma of another is referred to as

- (A) self pollination
- (B) self fertilization
- (C) cross pollination
- (D) asexual reproduction

46. A fruit has 8 seeds. How many ovules are MOST likely present in the flower from which this fruit is formed?

- (A) 2
- (B) 4
- (C) 8
- (D) 16

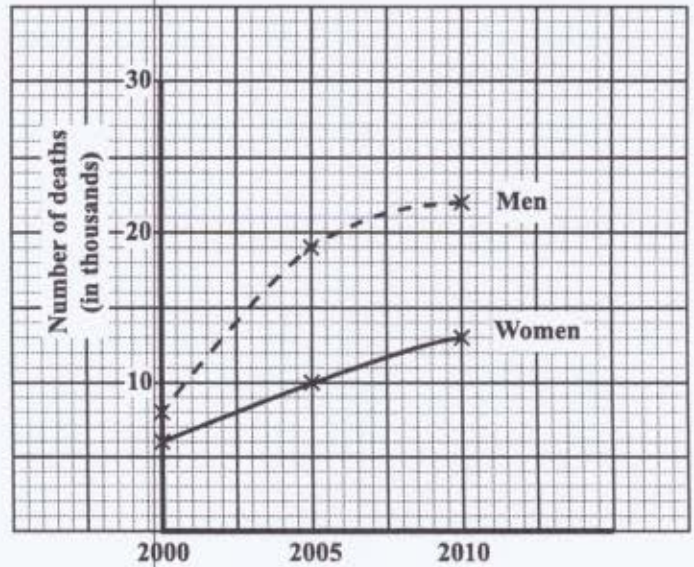
47. Which of the following may be caused by pathogens?

- (A) Anaemia
- (B) Heart disease
- (C) Physical addictions
- (D) Communicable diseases

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

Item 49 refers to the following graph showing the number of deaths due to AIDS.



49. The total number of persons who died from AIDS in 2010 is

- (A) 9 000
- (B) 13 000
- (C) 22 000
- (D) 35 000

50. A species consists of members that

- (A) occupy the same habitat
- (B) reproduce by asexual means
- (C) interbreed under natural conditions
- (D) interbreed to produce infertile offspring

51. Genetic variation arises from

- (A) cloning
- (B) mitosis
- (C) sexual reproduction
- (D) asexual reproduction

52. Two alleles of a gene are situated at

- (A) the same locus on a homologous pair of chromosomes
- (B) different loci on a homologous pair of chromosomes
- (C) the same locus on a different homologous pair of chromosomes
- (D) different loci on a different homologous pair of chromosomes

53. Cell division by mitosis occurs in humans when
- (A) the embryo develops
 - (B) ova are produced
 - (C) sperms are produced
 - (D) gametes are formed

Item 54 refers to the following diagram of a bean seedling.



54. At this stage, cell division occurs by
- (A) photosynthesis
 - (B) respiration
 - (C) meiosis
 - (D) mitosis
55. 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
 - (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

56. In a particular plant, red and white flower colour show codominance. If two heterozygous (pink) flowers are crossed, the expected phenotypic ratio of the offspring is
- (A) all pink
 - (B) 1 red: 1 white
 - (C) 3 red: 1 white
 - (D) 1 red: 2 pink: 1 white
57. Modern species of farm animals bred for food are quite different from their ancestors. The BEST explanation for this is that they
- (A) have undergone natural selection
 - (B) have been specifically chosen by man because they provide large amounts of food
 - (C) are the result of artificial selection to bring good qualities together
 - (D) are the result of man and nature working together to improve quality
58. Two species of spinach grow in the same area, one flowers during the dry season while the other only flowers during the rainy season. This is an example of
- (A) mechanical isolation
 - (B) temporal isolation
 - (C) ecological isolation
 - (D) behavioural isolation

59. Natural selection can be defined as the process by which natural populations

- (A) compete with other populations for survival
- (B) mutate in order to survive
- (C) remain well adapted to their habitat
- (D) gradually bring about changes in their habitat

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

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

END OF TEST

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