



CANDIDATE – PLEASE NOTE!

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

TEST CODE

FORM TP

MAY/JUNE 2017

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

BIOLOGY

Paper 01 - General Proficiency

1 hour 15 minutes

06 JUNE 2017 (p.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

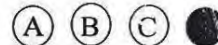
1. This test consists of 60 items. You will have 1 hour and 15 minutes to answer them.
2. In addition to this test booklet, you should have an answer sheet.
3. Each item in this test has four suggested answers lettered (A), (B), (C), (D). Read each item you are about to answer and decide which choice 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) Diab tes
- (C) Influenza
- (D) Anaemia

Sample Answer



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

5. If you want to change your answer, erase it completely before you 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.

1. Which of the following features is used to classify a group of organisms as Class Insecta?

- (A) Size
- (B) Shape
- (C) Colour
- (D) Segments

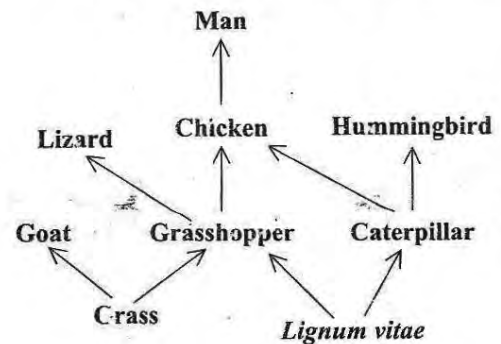
2. Which of the following options correctly defines a niche and a habitat?

	Niche	Habitat
(A)	The role that an organism plays in the habitat in which it lives	The place where an organism lives
(B)	The place where an organism lives	The role that an organism plays in the habitat in which it lives
(C)	A community of living organisms which shares the environment	The abiotic and biotic factors of the ecosystem
(D)	The biotic factors of the ecosystem where the organism lives	The abiotic factors of the ecosystem where the organism lives

3. Which of the following relationships may present harm to one of the organisms involved?

- I. Commensalism
 - II. Parasitism
 - III. Predation
- (A) I and II only
 - (B) I and III only
 - (C) II and III only
 - (D) I, II and III

Item 4 refers to the following food web.



4. A herbivore, carnivore and omnivore respectively are

- (A) goat, lizard, man
- (B) grass, grasshopper, lizard
- (C) caterpillar, hummingbird, goat
- (D) *Lignum vitae*, grasshopper, chicken

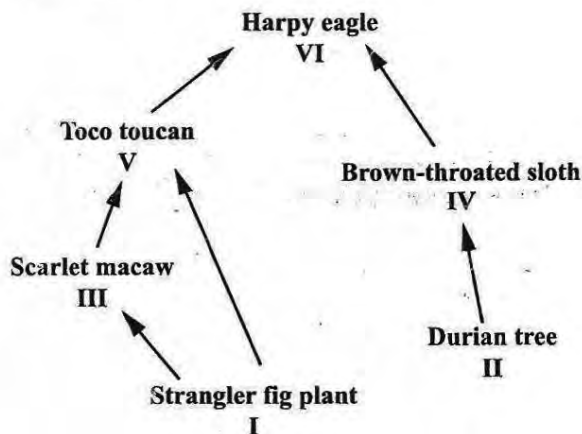
5. Which of the following organisms are MOST important in biodegradation?

- (A) Bacteria
- (B) Vultures
- (C) Omnivores
- (D) Earthworms

6. Which of the following is NOT true about decomposers?

- (A) They release nutrients for recycling.
- (B) They reproduce faster in low temperatures.
- (C) They are more abundant in damp places.
- (D) They prevent the accumulation of dead organic matter.

Item 7 refers to the simple food web constructed from some organisms found in the arboreal region of the tropical rain forest.



7. The predators in the food web are

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

8. Only about 10% of the energy stored in food is available to the next organism in a food chain because

- (A) most of the energy is lost as heat during the process of respiration
- (B) most of the energy is lost during the process of excretion
- (C) there are fewer consumers than producers in a food chain
- (D) many consumers compete for the same food source

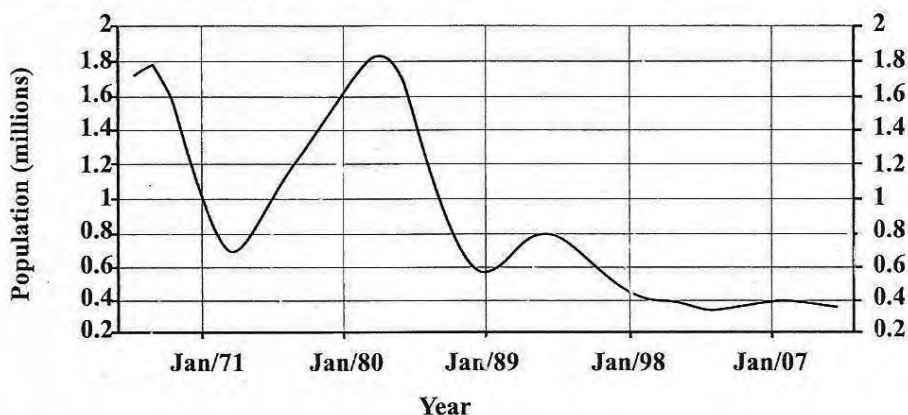
9. Which of the following is the MAIN advantage of recycling?

- (A) Recycled products are cheaper.
- (B) Recycled products are more durable.
- (C) Recycling saves on raw materials.
- (D) Recycling creates jobs.

10. Which of the following statements BEST outlines why the coral reefs in the Caribbean are at risk?

- (A) There has been overfishing of invasive species
- (B) The Caribbean is a popular tourist destination.
- (C) There have been many hurricanes in the Caribbean.
- (D) There has been a decrease in the volume of sewage flowing into the reefs.

Item 11 refers to the following diagram.



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. Epidemic of a deadly disease
- III. Increase in migration
- IV. Decrease in fatal crimes

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

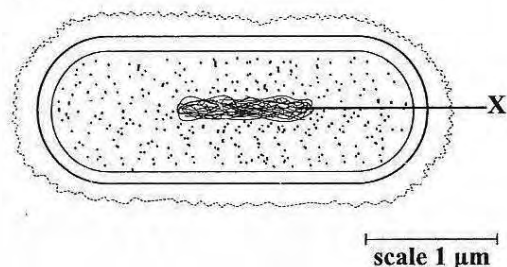
12. When compared to a cheek cell, a muscle cell contains more

- (A) vacuoles
- (B) ribosomes
- (C) mitochondria
- (D) chromosomes

14. Which of the following comparisons of the cell wall and 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

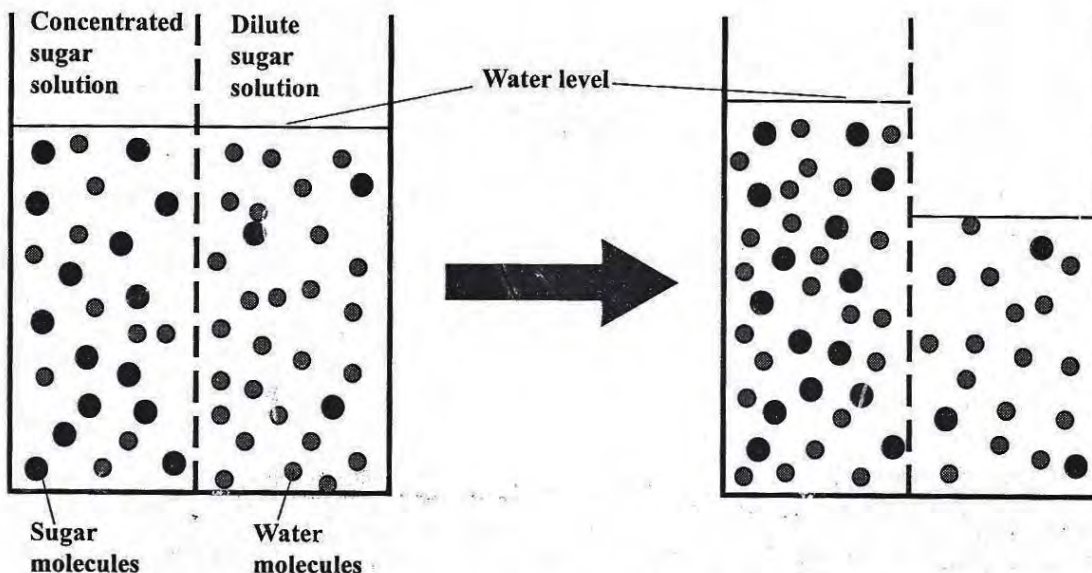
Item 13 refers to the following diagram of a bacterium.



13. The part labelled X is the

- (A) nucleus
- (B) vacuole
- (C) strand of DNA
- (D) cytoplasm containing ribosomes

Item 15 refers to the following diagram which shows a process by which substances are moved into and out of cells.



15. Which of the following correctly identifies and describes the process occurring above?

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

Item 16 refers to the following table which shows the results of food tests performed on three food samples, X, Y and Z.

Food Sample	Test and Observation
X	Violet colour with sodium hydroxide and copper sulphate
Y	Blue/black precipitate with iodine
Z	Orange precipitate when heated with Benedict's reagent after hydrolysis

16. The samples X, Y and Z respectively MOST likely contain

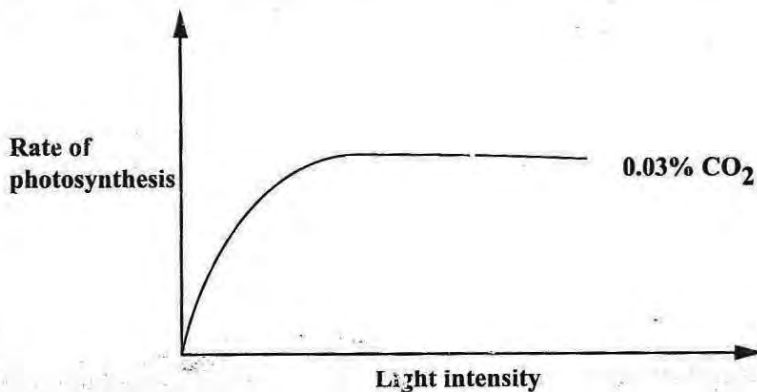
	X	Y	Z
(A)	Non-reducing sugar	Starch	Protein
(B)	Protein	Reducing sugar	Starch
(C)	Starch	Protein	Reducing sugar
(D)	Protein	Starch	Non-reducing sugar

17. Which of the following are true about nutrition?

	Type of Nutrition	Definition	Example
I	Autotrophic	Use of simple inorganic substances to manufacture complex organic substances	Green algae
II	Heterotrophic	The consumption of complex organic substances to produce simpler substances	Humans
III	Saprophytic	The use of dead, organic matter to manufacture essential nutrients	Fungi

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

Item 18 refers to the following graph showing the relationship between light intensity and photosynthesis.



18. Which of the following statements BEST accounts for the shape of the graph?
- (A) As rate of photosynthesis increase, there is a decrease in carbon dioxide levels.
 - (B) As light intensity increases, there is an increase in photosynthesis, until there is no further increase in the rate due to some other limiting factor.
 - (C) As light intensity increases, the rate of photosynthesis also increases, until a stationary phase exists, when denaturation of the enzymes occur.
 - (D) As carbon dioxide levels gradually increase, there is a similar increase in the rate of photosynthesis, until a plateau phase exists where no further increase in carbon dioxide results in any further increase in photosynthesis.

19. An enzyme is BEST defined as a molecule which

- (A) increases the rate of a chemical reaction
- (B) decreases the rate of a chemical reaction
- (C) increases the rate of a chemical reaction but remains unchanged at the end of the reaction
- (D) decreases the rate of a chemical reaction but remains unchanged at the end of the reaction

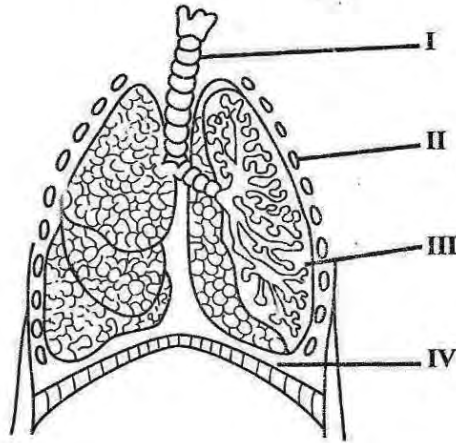
20. A 50-year old male is advised by his doctor to pay special attention to the amount of salt in his diet. He probably has a high chance of developing

- (A) obesity
- (B) diabetes
- (C) hypertension
- (D) cardiovascular disease

21. The surface area of the lungs is greatly increased by the

- (A) double membranes of the pleura
- (B) large numbers of alveoli
- (C) dense network of capillaries
- (D) branching of the bronchioles

Item 22 refers to the following diagram of the respiratory system.



22. Which of the labelled parts represents the ribcage?

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

23. Which of the following is an effect of nicotine found in cigarette smoke?

- (A) Increased heart rate
- (B) Increased beating of cilia
- (C) Reduced oxygen transport by the blood
- (D) Increased mucus production in the cells lining the respiratory passage

24. Which of the following options is true for aerobic and anaerobic respiration?

	Aerobic	Anaerobic
(A)	Does not use O ₂ .	Uses O ₂ .
(B)	Occurs in the cytoplasm.	Occurs in the mitochondria.
(C)	Releases large amounts of energy.	Releases small amounts of energy.
(D)	At least one product is organic.	Products are always inorganic.

25. Which of the following statements is NOT true of the xylem of a flowering plant?

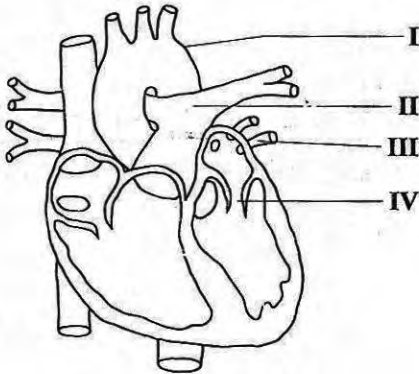
- (A) It is non-living.
- (B) It contains mitochondria.
- (C) It has lignified walls for support.
- (D) It transports water and mineral salts.

26. Which of the following options BEST identify some of the transport substances in animals?

- I. Amino acids
- II. Hormones
- III. Sucrose

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

Item 27 refers to the following diagram of a human heart.



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

	I	II	III	IV
(A)	Aorta	Pulmonary artery	Pulmonary vein	Bicuspid or Mitral valve
(B)	Pulmonary artery	Posterior vena cava	Aorta	Bicuspid or Mitral valve
(C)	Aorta	Pulmonary vein	Pulmonary artery	Semi-lunar valve
(D)	Pulmonary vein	Pulmonary artery	Anterior vena cava	Tricuspid valve

28. The essential vitamin and mineral salt required for blood clotting in humans are

- (A) A and Mg^{2+}
- (B) C and K^+
- (C) B and Na^+
- (D) K and Ca^{2+}

29. Artificial immunity can best be described as immunity

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

30. Although glucose is found in the blood plasma, it does not appear in the urine because of

- (A) osmosis
- (B) secretion
- (C) ultrafiltration
- (D) selective reabsorption

31. The best description of the role of excretion in living organisms is to

- (A) produce urine
- (B) produce faeces
- (C) get rid of toxic waste
- (D) get rid of excess water

32. Which of the following is NOT a form of excretion in plants?

- (A) Carbon dioxide diffusing in, through the stomata
- (B) Substances being stored in the bark of a tree
- (C) Water vapour diffusing out, through the epidermis
- (D) Stored calcium oxalate crystals in leaves during leaf fall

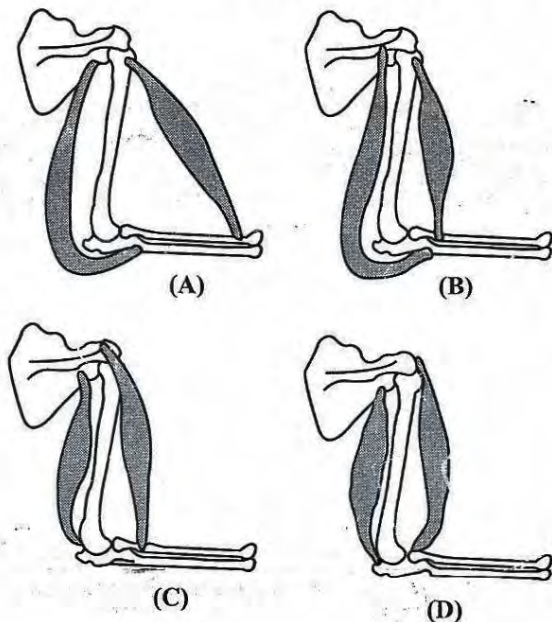
33. Which of the following correctly describes movement in plants?

- (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?

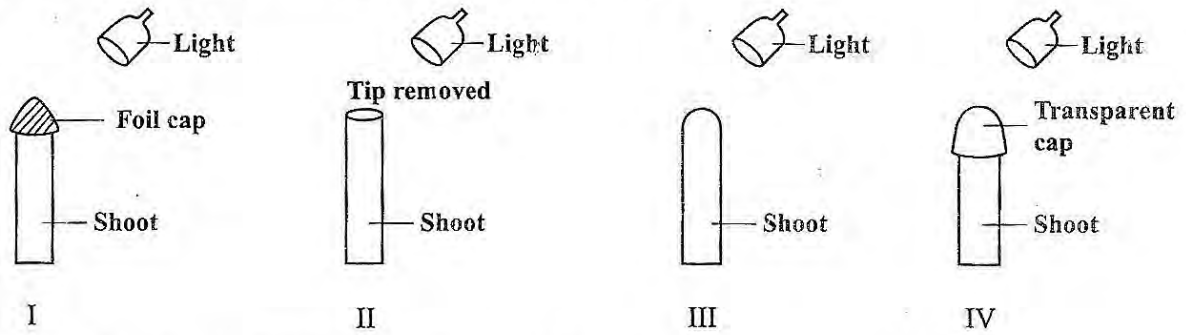
- (A) It protects delicate organs such as the heart and lungs.
- (B) It is made up of hard, non-living tissues.
- (C) It produces red and white blood cells.
- (D) It gives the body its shape.

Item 35 refers to the following diagrams.



35. Which of the muscle-bone attachments shown above is accurate?

Item 36 refers to the following diagrams illustrating an experiment.



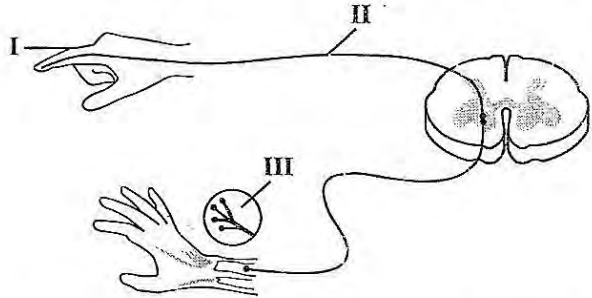
36. After a few days the TALLEST shoot would MOST likely be

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

37. Which of the following BEST describes the terms 'stimulus' and 'response'?

	Stimulus	Response
(A)	A deliberate provocation of an organism	The movement of an organism
(B)	An organism's exposure to sunlight	The growth of the organism away from light
(C)	A wave of excitement in an organism	Locomotion of the organism
(D)	A detectable change in an organism's environment	An organism's reaction to a stimulus

Item 38 refers to the following diagram.



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

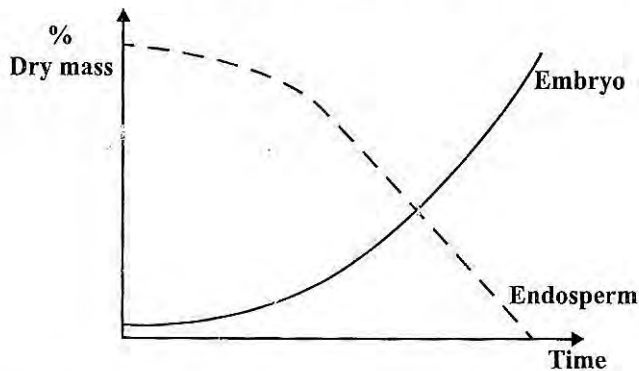
	I	II	III
(A)	Receptor	Relay nerve	Effector
(B)	Skin	Intermediate nerve	Muscle
(C)	Sensory nerve	Spinal nerve	Effector
(D)	Receptor	Spinal nerve	Effector

39. The smell of a hamburger being cooked causes Joan to salivate. Which of the following is the effector which brings about her response?

- (A) Cell in the nose
- (B) Salivary gland
- (C) Smell of food
- (D) Secretion of saliva

GO ON TO THE NEXT PAGE

Item 40 refers to the following graph which shows changes in the dry mass of an embryo and endosperm during germination.



40. From the graph, it is true to say that
- (A) the embryo begins to grow as the endosperm increases in mass
 - (B) the embryo and the endosperm decrease in mass at the same rate
 - (C) the embryo and the endosperm increase in mass at the same rate
 - (D) as the embryo grows, the food reserves are gradually depleted

41. The BEST description of the disease AIDS is

	Causative Agent	Treatment	Control	Prevention
(A)	DNA Virus	Antigens	Vaccination	Public education
(B)	Bacterium	Antibiotics	Monogamy	Abstinence; Condoms
(C)	RNA Virus	Anti-retrovirals, e.g. AZT	Monogamy	Abstinence; Condoms
(D)	Bacterium	Penicillin	Vaccination	Abstinence; Condoms

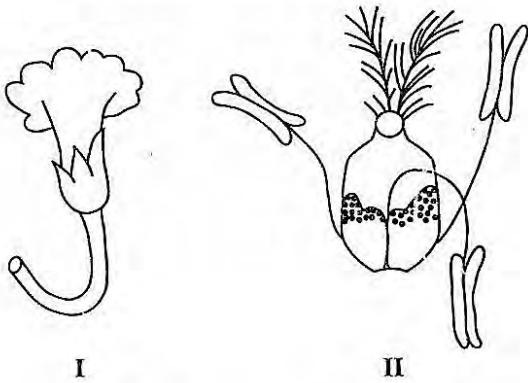
42. Production of new organisms from one parent only is known as

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

43. Which of the following forms of birth control is MOST likely 100% effective?

- (A) Birth control pill
- (B) Tubal ligation
- (C) Diaphragm
- (D) Condom

Item 44 refers to the following diagrams of flowers from two different types of plants.



44. 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.
45. Fertilization normally occurs in the
- (A) uterus
 - (B) vagina
 - (C) oviduct
 - (D) ovaries

Items 46–47 refer to the following organisms.

- (A) Host
- (B) Vector
- (C) Parasite
- (D) Pathogen

In answering Items 46–47, match the following descriptions to one of the options above. Each option may be used once, more than once or not at all.

46. An organism which causes a disease
47. An animal which carries a disease-causing organism but is not adversely affected by it

48. Which of the following is NOT a consequence of plant or human disease?
- (A) Food prices decrease
 - (B) Loss of productivity
 - (C) Higher absenteeism from school
 - (D) Larger part of national budget used to buy medications

49. Which of the following methods would be MOST appropriate for the treatment of chronic hypertension?

- I. Diet modification
- II. Exercise
- III. Vaccination

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

50. Applying a thin layer of oil on the surface of an open pond can control the population of mosquitoes because

- (A) mosquitoes cannot feed on an oily surface
- (B) a layer of oil makes it difficult for the larvae to obtain food
- (C) a layer of oil prevents the pupa from being able to obtain air
- (D) mosquitoes cannot fly if their wings are covered with a film of oil

51. On a certain Caribbean island where sugar cane is grown, a fungus is accidentally introduced into the island and it destroys the entire crop of sugar cane. Which of the following BEST describes what happened?

- (A) The plants were old and therefore more susceptible to the fungus.
- (B) The plants were not of a hardy enough variety to withstand the fungus.
- (C) The plants were planted too close together so the fungus spread easily.
- (D) There was no genetic variation among the plants so none could survive the attack.

52. Which of the following statements BEST describes a chromosome?

- (A) Two forms of the same gene
- (B) Structure made up of DNA wrapped around histones
- (C) Nucleic acid that contains all genetic information
- (D) Part of the DNA which carries genetic information to produce a protein

53. Which of the following is NOT A characteristic of meiosis?

- (A) Maintenance of the diploid number
- (B) Random assortment of genes
- (C) Crossing over of chromosomes
- (D) Genetic recombination of alleles

54. Tarzan and Jane, both of whom are heterozygous for Blood Groups A and B respectively can have offspring that are likely to be

- (A) 100% AB
- (B) 50% A: 50% AB
- (C) 25% AB: 50% B: 25% O
- (D) 25% A: 25% B: 25% AB: 25% O

55. Which of the following terms refers to visible characteristics of living things?

- (A) Gene
- (B) Genotype
- (C) Phenotype
- (D) Chromosome

56. Zane, the son of James and Jennifer may have inherited the red-green colour-blindness gene from his parents. Neither James nor Jennifer is colour-blind.

If N represents normal. What are the genotypes of the parents?

	James	Jennifer
(A)	$X^N Y$	$X^N X^n$
(B)	$X^n Y$	$X^N X^n$
(C)	$X^n Y$	$X^n X^n$
(D)	$X^N Y$	$X^n X^n$

57. Which of the following describes the FINAL stage of the process of meiosis?

- (A) Separation of the sister chromatids.
- (B) Homologous chromosomes pair up.
- (C) Homologous chromosomes separate.
- (D) Crossing over of homologous chromosomes.

58. 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

59. The theory of evolution is based on natural selection. Which of the following is NOT a feature of natural selection?
- (A) Variation that can be passed to the next generation
 - (B) An environment that does not change
 - (C) Overproduction of offspring
 - (D) Competition for limited food supplies
60. Which of the following would be involved in the production of insulin by genetic engineering?
- I. Transfer of the human insulin gene to a bacterium
 - II. A vector to transfer the insulin gene
 - III. Production of insulin by the bacterium
- (A) I only
 - (B) I and II only
 - (C) II and III only
 - (D) I, II and III

END OF TEST

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