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 **01230010**

FORM TP 2013088

MAY/JUNE 2013

CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INTEGRATED SCIENCE
(Single Award)

Paper 01 – General Proficiency

1 hour 15 minutes

11 JUNE 2013 (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 how it is done in the sample item below.

   Sample Item

   Benzene dissolves stains caused by

   (A) tar
   (B) fruit
   (C) paint
   (D) starch

   Sample Answer

   ● Ⓑ Ⓒ Ⓓ

   The best answer to this item is "tar", so answer space (A) has been shaded.

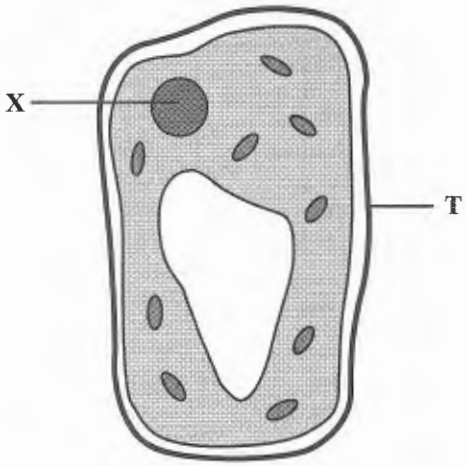
5. If you want to change your answer, erase it completely before you fill in your new choice.

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 this item later. Your score will be the total number of correct answers.

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

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Items 1–2 refer to the following diagram of a typical plant cell.



1. The structure labelled T is the

(A) nucleus
(B) vacuole
(C) cell wall
(D) chloroplast

2. The structure labelled X is the

(A) nucleus
(B) vacuole
(C) cell wall
(D) chloroplast

3. The structure responsible for the transfer of characteristics from parents to offspring is the

(A) vacuole
(B) cytoplasm
(C) chromosome
(D) cell membrane

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4. Which of the following word equations CORRECTLY summarises the process of photosynthesis?

(A) Glucose + oxygen → carbon dioxide + water + energy

(B) Glucose + $\xrightarrow[\text{chlorophyll}]{\text{light energy}}$ oxygen + carbon dioxide + water

(C) Carbon dioxide + water → glucose + oxygen + energy

(D) Carbon dioxide + water $\xrightarrow[\text{chlorophyll}]{\text{light energy}}$ glucose + oxygen

5. Which of the following shapes describes molar teeth?

(A) Pointed
(B) Rounded
(C) Flat-topped
(D) Chisel-shaped

6. Which nutrient is important for building strong muscles?

(A) Fat
(B) Sugar
(C) Starch
(D) Protein

7. In which of the following processes is glucose converted into carbon dioxide, water and energy?

(A) Digestion
(B) Excretion
(C) Respiration
(D) Fermentation

8. Which of the following systems is likely to be affected by the presence of dust in the air?

(A) Digestive
(B) Endocrine
(C) Respiratory
(D) Circulatory

9. Which of the following air pollutants combines with the haemoglobin in the red blood cells?

(A) Carbon dioxide
(B) Nitrogen dioxide
(C) Sulphur dioxide
(D) Carbon monoxide

10. The names of three types of blood vessels found in the human circulatory system are arteries, veins and

(A) valves
(B) tubules
(C) capillaries
(D) bronchioles

11. Which component of the human blood transports oxygen?

(A) Platelet
(B) Phagocyte
(C) Lymphocyte
(D) Red blood cell

12. The amount of water entering the tissues of the body is controlled by

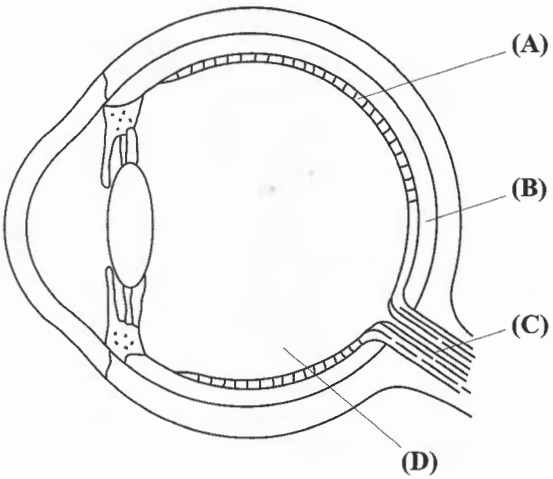
(A) egestion
(B) nutrition
(C) excretion
(D) osmoregulation

13. Antibodies are important in the human body because they

(A) control hormones
(B) protect against diseases
(C) help make red blood cells
(D) regulate blood glucose levels

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Item 14 refers to the diagram below which shows several labelled structures in the human eye.



14. Which structure is responsible for carrying impulses to the brain?

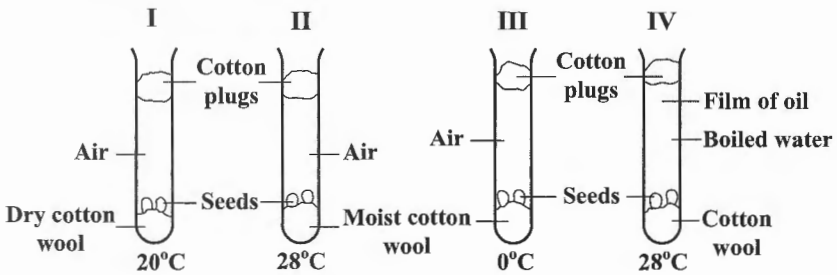
15. Which of the following hormones regulates the level of blood sugar in humans?

(A) Insulin
(B) Secretin
(C) Prolactin
(D) Adrenaline

16. Which of the following sequences correctly represents the order of the processes involved in the reproduction and growth of plants?

(A) Fertilization, germination, pollination
(B) Germination, fertilization, pollination
(C) Pollination, fertilization, germination
(D) Pollination, germination, fertilization

Item 17 refers to the diagrams below which display seeds under different conditions in four test tubes plugged with cotton wool.



17. In which test tube is germination MOST likely to take place?

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

18. Which of the following hormones is produced in emergency situations?

(A) Insulin
(B) Secretin
(C) Prolactin
(D) Adrenaline

19. Which of the following methods of birth control is MOST likely to require an accurate prediction of the ovulation period?

(A) Rhythm
(B) Barrier
(C) Surgical
(D) Hormonal

20. The testes of the human male correspond to the anthers of flowers because they both

(A) are separate organs
(B) have similar shapes
(C) produce male sex cells
(D) have tubes leading from them

21. Wet clothes are MOST likely to dry quickly under conditions of

(A) high temperature and low humidity
(B) high temperature and high humidity
(C) low temperature and low humidity
(D) low temperature and high humidity

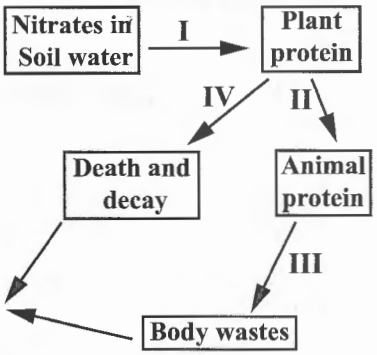
22. Which of the following is the method of heat transfer that occurs in fluids?

(A) Radiation
(B) Convection
(C) Conduction
(D) Evaporation

23. Solar energy is transferred through space by

(A) radiation
(B) convection
(C) conduction
(D) evaporation

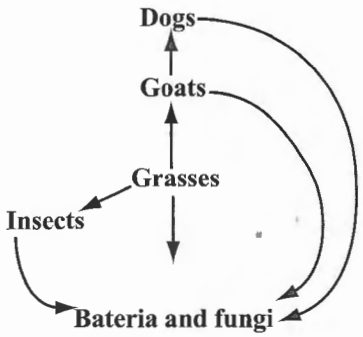
Item **24** refers to the diagram below which shows part of a nitrogen cycle.



24. During which of the above processes is excretion occurring?

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

Item 25 refers to the diagram below which shows a food web.



25. Which of the following organisms are herbivores?

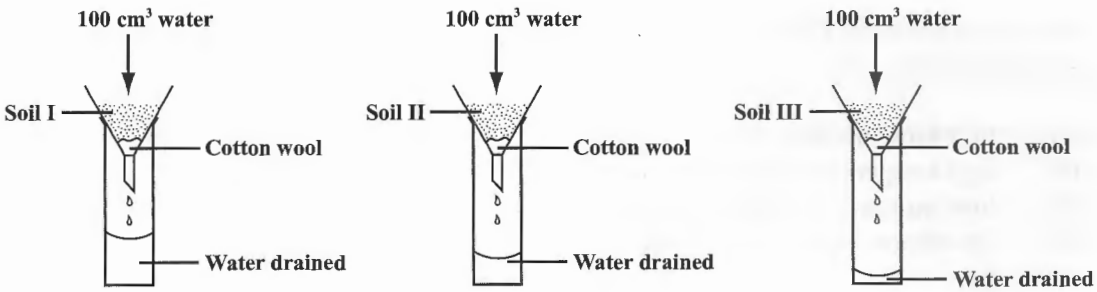
(A) Dogs
(B) Goats
(C) Fungi
(D) Bacteria

26. Which of the following is NOT a cause of soil erosion?

(A) Terracing of hillsides
(B) Heavy water run-off on unprotected soil
(C) The ploughing of lands during the rainy season
(D) Allowing sheep to graze a pasture after the cattle are removed

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Item 27 refers to the diagrams below which show an experiment to measure the water drainage of clay, loam and sand.



27. Which of the following statements is MOST likely to be true?

(A) Soil I is loam.
(B) Soil II is sandy.
(C) Soil III is clay.
(D) Soil III is sandy.

28. The boundary formed by the meeting of two air masses is called a

(A) zone
(B) front
(C) cloud mass
(D) storm surge

29. Which of the following fishing methods is LEAST efficient?

(A) Drift net
(B) Trawl net
(C) Long line
(D) Hand line

30. The process by which water passes from the ocean to the atmosphere is

(A) respiration
(B) evaporation
(C) precipitation
(D) condensation

31. Which of the following processes used in the treatment of water will eliminate harmful bacteria?

(A) Aeration
(B) Filtration
(C) Fluoridation
(D) Chlorination

32. Which of the following is NOT a water safety device?

(A) Life raft
(B) Life jacket
(C) Inflatable tube
(D) Inflatable balloon

33. Which of the following gases is associated with the scuba-diving hazard known as 'bends'?

(A) Oxygen
(B) Nitrogen
(C) Helium
(D) Hydrogen

34. Which method of waste treatment is LEAST harmful to the environment?

(A) Burning
(B) Burying
(C) Recycling
(D) Landfill

35. The following conditions exist inside a pile of decomposing garbage:

I. It is moist.
II. It is warm.
III. There is much organic matter.

Which of the conditions above make a garbage pile suitable for the laying of housefly eggs?

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

36. Which of the following protective wear is BEST suited for someone welding a broken iron gate?

(A) Goggle
(B) Helmet
(C) Glove
(D) Chest mask

37. A carbon dioxide fire extinguisher works by

(A) cooling the fire
(B) including oxygen
(C) excluding oxygen
(D) spreading out the heat

38. Which of the following is NOT a conductor of electricity?

(A) Rubber
(B) Iron
(C) Copper
(D) Carbon

39. Which of the substances listed below MUST be present for rusting to occur?

I. Oxygen
II. Water
III. Oil

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

40. Plastic is usually used in electrical plugs because plastic

(A) is fairly strong
(B) has a low density
(C) is a poor conductor of heat energy
(D) is a poor conductor of electricity

41. Windows made from steel will rust quickly by the seaside. This is because the air by the seaside has a high concentration of

(A) oxygen
(B) iodine vapour
(C) carbon dioxide
(D) sodium chloride

42. Which of the following chemicals remove nail polish?

(A) Borax
(B) Acetone
(C) Washing soda
(D) Methylated spirit

43. The following data were obtained in an experiment to investigate in which soil pH different crops grow best.

CROP	pH Value of Soil
(A)	4.0 – 6.0
(B)	6.0 – 8.0
(C)	8.0 – 10.0
(D)	10.0 – 12.0

Which crop preferred a neutral soil?

44. Which of the following substances will produce a suspension in water?

(A) Clay
(B) Salt
(C) Sugar
(D) Baking Soda

Item **45** refers to the following statements about detergents.

I. They form scum with hard water.
II. They are made from crude oil.
III. They are biodegradable and do not cause permanent damage to the environment.

45. Which statements are true for soapy detergents?

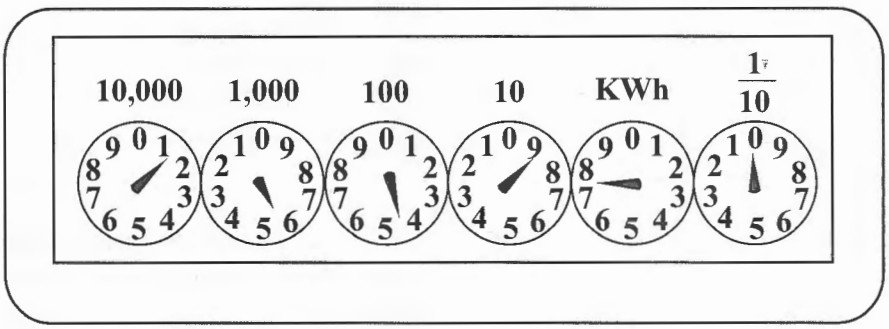
(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

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46. Which of the following metals produces hydrogen gas when reacted with hydrochloric acid?

(A) Iron
(B) Gold
(C) Silver
(D) Copper

Item **47** refers to the diagram below which represents an analogue meter used to measure the amount of electricity used.



47. What is the reading on the meter?

(A) 15 487 kWh
(B) 16 597 kWh
(C) 25 487 kWh
(D) 26 597 kWh

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48. A refrigerator has a rating of 0.45 kW. The electricity used, in kWh, by this refrigerator for one day is equal to

(A) 0.45

(B) $\frac{0.45}{24}$

(C) 0.45 + 24

(D) 0.45 x 24

49. Which electrical component is designed to melt and break the circuit if too much current passes through it?

(A) Fuse
(B) Flex
(C) Plug
(D) Switch

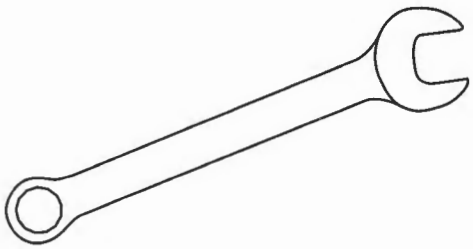
50. The unit of current is the

(A) ohm
(B) volt
(C) watt
(D) ampere

51. In the Caribbean, the energy used in the production of electricity is derived mainly from

(A) waterfalls
(B) fossil fuels
(C) solar panels
(D) wind turbines

Item 52 refers to the following diagram of a spanner below.

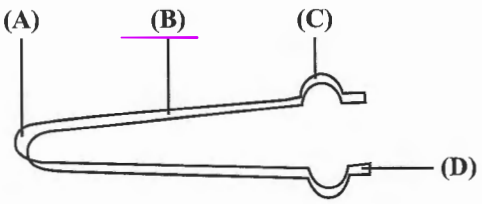


52. The spanner above is an example of

(A) a lever
(B) a pulley
(C) an inclined plane
(D) a hydraulic press

53. The diagram below shows tongs with labels (A), (B), (C) and (D).

In which of the labelled positions is the effort usually applied?



Item 54 refers to the following sources of energy.

I. Coal
II. Wind
III. Solar
IV. Natural gas

54. Which of the above are referred to as alternative sources of energy?

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

55. Which of following formulae is used to calculate the mechanical advantage (MA) of a machine?

(A) $MA = \frac{\text{Load}}{\text{Effort}}$

(B) $MA = \frac{\text{Effort}}{\text{Load}}$

(C) MA = Effort – Load

(D) MA = Effort × Load

Item **56** refers to the following picture of an athlete jumping over a hurdle.



56. What type of energy is the athlete using to jump over the hurdle?

(A) Heat
(B) Sound
(C) Kinetic
(D) Potential

57. Which of the following devices does NOT use an electromagnet?

(A) Relay
(B) Light bulb
(C) Electric bell
(D) Electric motor

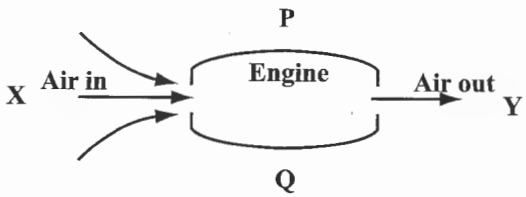
58. There are limits to the height and mass of material which can be transported by a vehicle. The reason for this is

(A) to ensure that the road is not damaged by the weight
(B) that the vehicle is too weak to carry the load
(C) that the vehicle would not be able to move fast enough
(D) to ensure that the vehicle's centre of gravity is not raised beyond safe limits

59. Which of the following energy conversions takes place during the process of photosynthesis?

(A) Heat → light
(B) Light → kinetic
(C) Chemical → heat
(D) Light → chemical

Item **60** refers to the diagram below which represents the passage of air through the engine of a jet plane.



60. The direction in which the plane is moving is

(A) X to Y
(B) Y to X
(C) P to Q
(D) Q to P

END OF TEST

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