



FORM TP 2021080

**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 **01253010**

MAY/JUNE 2021

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

**HUMAN AND SOCIAL BIOLOGY**

**Paper 01 – General Proficiency**

*1 hour 15 minutes*

**31 MAY 2021 (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

Abnormally high blood pressure is called

- (A) distension
- (B) hypotension
- (C) hypertension
- (D) hyperglycaemia

Sample Answer



The best answer to this item is “hypertension”, so (C) 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.**

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1. Plants obtain nitrates
- (A) directly from nitrogen gas
  - (B) by the process of photosynthesis
  - (C) by absorbing nitrates through their roots
  - (D) when nitrates diffuse into the stomata

2. Which of the following features is NOT common to all living organisms?

- (A) Using food to produce energy
- (B) Producing identical cells in reproduction
- (C) Getting rid of metabolic waste products
- (D) Releasing energy by a process of respiration

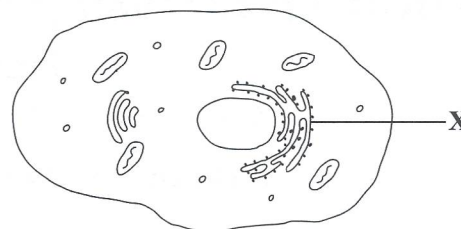
3. In which of the following structures does photosynthesis occur?

- (A) Ribosomes
- (B) Golgi bodies
- (C) Chloroplasts
- (D) Mitochondria

4. During osmosis, the movement of water molecules through the semi-permeable membrane continues until the

- (A) amount of water molecules is equalized on both sides
- (B) hydrostatic pressure equals the osmotic pressure
- (C) osmotic pressure equals the osmotic potential
- (D) turgidity and flaccidity are equal

Item 5 refers to the following diagram which represents an animal cell.



5. The structure labelled X is involved in the

- (A) storage of fats
- (B) production of proteins
- (C) breaking down of substances
- (D) packaging of substances for transport out of the cell

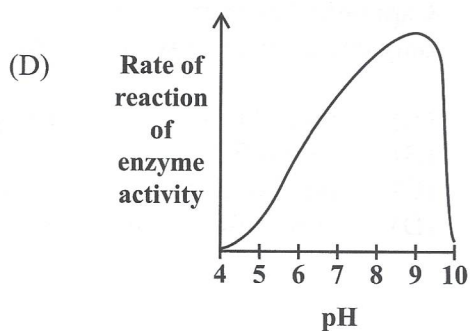
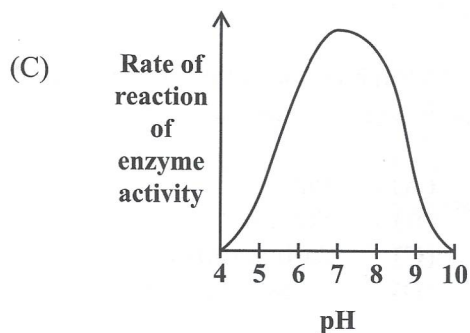
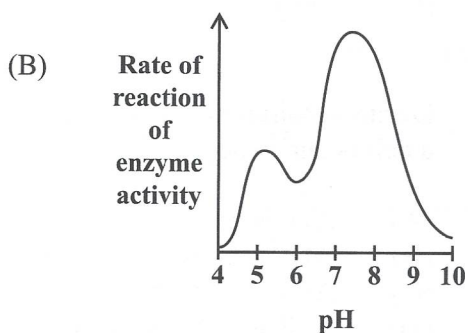
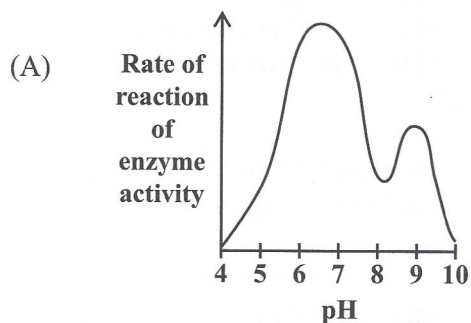
6. To which of the following food groups do oats belong?

- (A) Fruits
- (B) Staples
- (C) Legumes
- (D) Vegetables

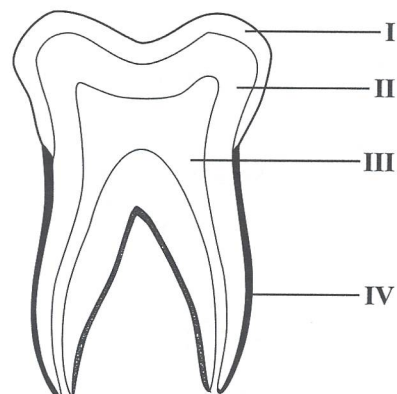
7. Which of the following statements is NOT true of anaemia?

- (A) It is caused by the presence of an extra chromosome.
- (B) It is caused by a lack of iron compounds in the diet.
- (C) It can be treated by eating green vegetables, liver and egg yolk.
- (D) It results from the manufacture of an inadequate number of red blood cells.

8. Which of the following graphs BEST represents the effect of pH on the activity of the enzyme, salivary amylase, in the digestive process?



Item 9 refers to the following diagram which shows the internal structure of a tooth.



9. The layer of the tooth which is harder than bone is labelled

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

10. One function of dietary fibre is to

- (A) make the food we eat less bulky  
(B) provide increased cellulose to the body  
(C) decrease the rate at which food moves through the alimentary canal  
(D) increase the rate at which food moves through the alimentary canal

11. Kwashiorkor is a deficiency disease caused by a lack of

- (A) fats  
(B) protein  
(C) glycogen  
(D) carbohydrates

12. The formula for determining Body Mass Index (BMI) is
- (A)  $\frac{\text{Weight (kg)}}{\text{Height (m)}}$
- (B)  $\frac{\text{Weight}^2 (\text{kg}^2)}{\text{Height (m)}}$
- (C)  $\frac{\text{Weight (kg)}}{\text{Height}^2 (\text{m}^2)}$
- (D)  $\frac{\text{Weight}^2 (\text{kg}^2)}{\text{Height}^2 (\text{m}^2)}$
13. Which of the following is NOT a fat-soluble vitamin?
- (A) Vitamin A
- (B) Vitamin C
- (C) Vitamin D
- (D) Vitamin K
14. The process of egestion is defined as the removal of
- (A) toxic waste
- (B) non-toxic waste
- (C) metabolic waste
- (D) undigested waste
15. Climbing up a mountain, a group of hikers finds that breathing becomes difficult. This is MOST likely because
- (A) the air is colder
- (B) the air has less oxygen
- (C) they become tired from the long walk
- (D) they lose too much water by sweating
16. Which of the following reagents is used to test for glucose?
- (A) Iodine solution
- (B) Copper sulphate
- (C) Sodium hydroxide
- (D) Benedict's solution
17. Which of the following structures is NOT part of the respiratory system?
- (A) Oesophagus
- (B) Trachea
- (C) Nostril
- (D) Lung
18. During respiration, the release of energy in a cell occurs when
- (A) ATP is converted to ADP
- (B) ADP is converted to ATP
- (C) ADP is converted to lactic acid
- (D) ATP and oxygen form oxyhaemoglobin
19. Which of the following substances found in cigarette smoke is addictive?
- (A) Tar
- (B) Nicotine
- (C) Carbon dioxide
- (D) Carbon monoxide
20. Capillaries have very thin walls which have only one layer of cells. This is to allow
- (A) rapid diffusion of gases and glucose
- (B) slow diffusion of gases and glucose
- (C) rapid diffusion of protein and fats
- (D) slow diffusion of protein and fats

GO ON TO THE NEXT PAGE

21. Coronary thrombosis occurs when
- (A) the valves in the heart stop working
  - (B) there is too much blood flowing through the heart
  - (C) a coronary artery becomes blocked with a blood clot
  - (D) the coronary vein becomes blocked with a blood clot
22. Which of the following BEST describes the function of a pacemaker in the heart?
- (A) Increases the heart rate
  - (B) Regulates the heart rate
  - (C) Decreases the heart rate
  - (D) Prevents the heart from overworking

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Item 23 refers to the following incomplete table which shows blood vessels and the organs they supply.

Blood Vessel	Organ Supplied
I	Lung
Hepatic artery	II
III	Intestine
Renal artery	IV

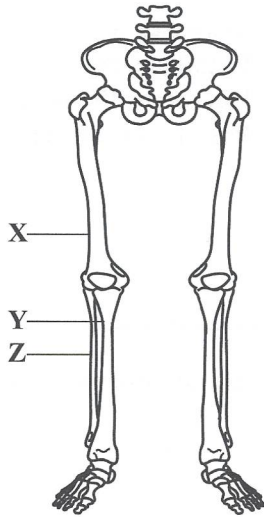
23. Which of the following correctly identifies I, II, III and IV?

	I	II	III	IV
(A)	Iliac artery	Liver	Carotid artery	Kidney
(B)	Carotid artery	Kidney	Iliac artery	Liver
(C)	Pulmonary artery	Liver	Mesenteric artery	Kidney
(D)	Mesenteric artery	Kidney	Pulmonary artery	Liver

24. Blood pressure is HIGHEST in the
- (A) veins
  - (B) arteries
  - (C) arterioles
  - (D) capillaries

GO ON TO THE NEXT PAGE

Item 25 refers to the following diagram of part of the human skeleton.



25. Which of the following combinations correctly identifies the bones labelled X, Y and Z?

	Bone X	Bone Y	Bone Z
(A)	Tibia	Femur	Fibula
(B)	Femur	Tibia	Fibula
(C)	Fibula	Tibia	Femur
(D)	Femur	Fibula	Tibia

26. Which group BEST represents the location of the ball and socket, hinge and fixed joints?

	Ball and Socket	Hinge	Fixed
(A)	Elbow	Cranium	Shoulder
(B)	Jaw	Wrist	Knee
(C)	Shoulder	Elbow	Cranium
(D)	Wrist	Knee	Jaw

27. Muscle groups that oppose each other to produce movement are described as

- (A) synergistic
- (B) contracting
- (C) antagonistic
- (D) counteracting

28. A small volume of urine will MOST likely be produced after

- (A) excessive exercise
- (B) a high water intake
- (C) eating a diet low in salt
- (D) being in a cold room for a long time

29. Liam notices that his face is flushed (red) after playing football. Which of the following processes causes his face to be flushed?

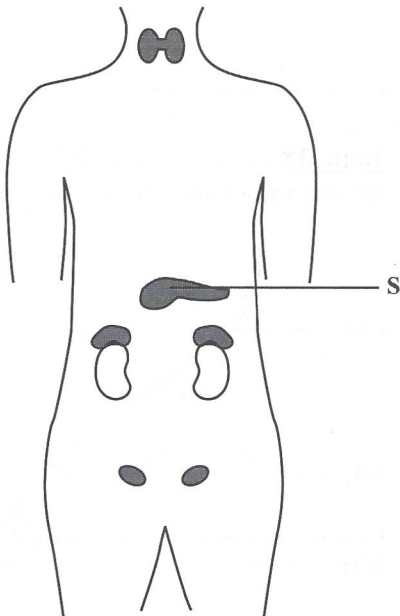
- (A) Insulation
- (B) Evaporation
- (C) Vasodilation
- (D) Vasoconstriction

30. Which of the following joints allows movement in **all** directions?

- (A) Knee
- (B) Ankle
- (C) Elbow
- (D) Shoulder

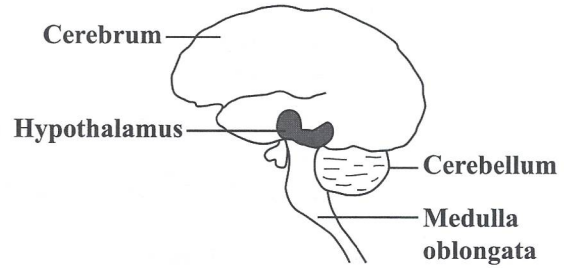
31. Which of the following describes homeostasis?
- (A) Maintenance of a constant internal environment
  - (B) Transportation of useful substances to the kidney
  - (C) The process of an enzyme converting glucose to glycogen
  - (D) The process that allows products of digestion to be incorporated into the body

Item 32 refers to the following diagram showing some of the organs in the body which produce hormones.



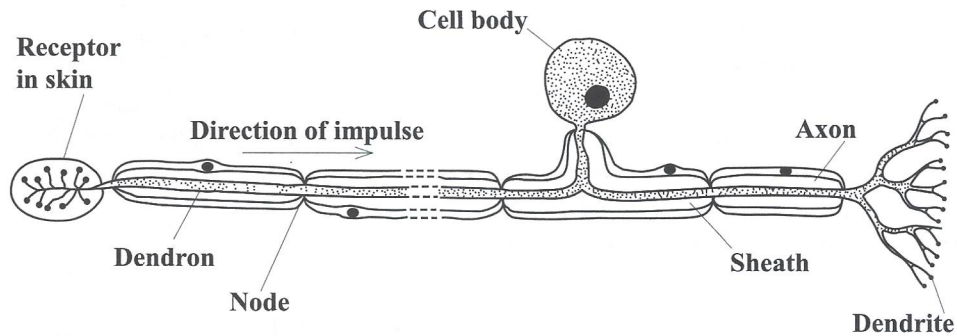
32. Which hormone is secreted by the organ labelled S?
- (A) Adrenaline
  - (B) Oestrogen
  - (C) Thyroxine
  - (D) Insulin

Item 33 refers to the following diagram of a human brain.



33. Which part of the brain is responsible for conscious thought?
- (A) Cerebrum
  - (B) Cerebellum
  - (C) Hypothalamus
  - (D) Medulla oblongata
34. Which of the following hormones is responsible for causing the liver to convert excess sugar to glycogen?
- (A) Insulin
  - (B) Glucagon
  - (C) Adrenalin
  - (D) Antidiuretic hormone

Item 35 refers to the following diagram which illustrates a nerve cell conducting an impulse from the sense organs to the central nervous system.



35. The cell above is known as a

- (A) spinal nerve
- (B) cranial nerve
- (C) motor neurone
- (D) sensory neurone

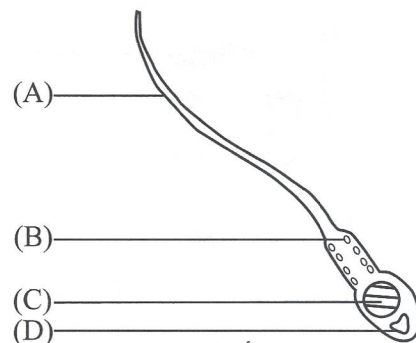
36. When viewing a distant object, the ciliary muscle

- (A) relaxes and the lens bulges
- (B) contracts and the lens bulges
- (C) relaxes and the lens flattens
- (D) contracts and the lens flattens

37. Images in the eye are formed on the

- (A) choroid layer
- (B) optic nerve
- (C) retina
- (D) sclera

Item 38 refers to the following diagram which shows the human spermatozoon.

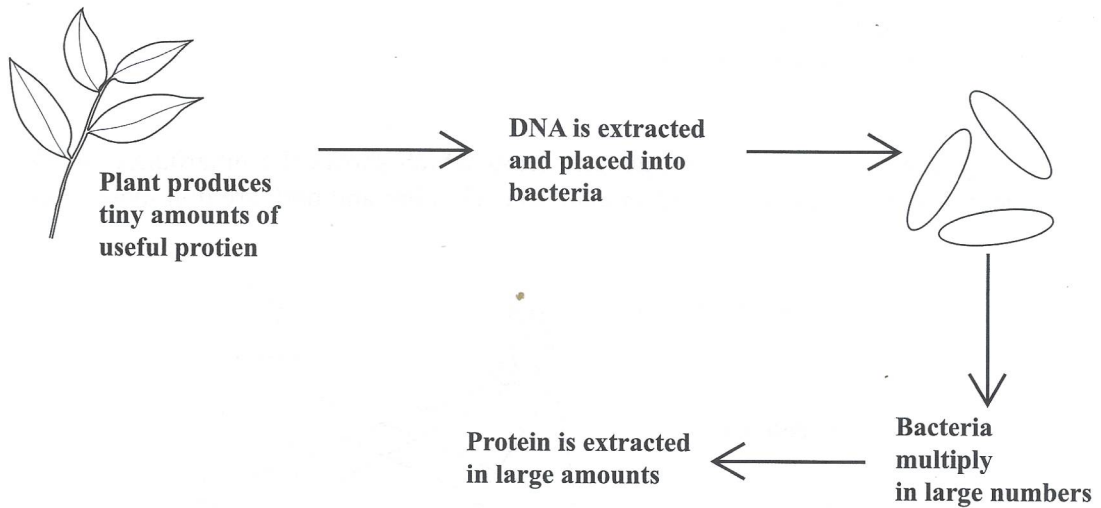


38. Which of the labelled parts above contains mitochondria?

39. Which of the following birth control methods is considered to be the LEAST reliable?
- (A) Condom
  - (B) Rhythm
  - (C) Oral contraceptive
  - (D) Intra-uterine device
40. Which of the following methods of contraception functions by preventing sperm from entering the uterus?
- (A) Barrier
  - (B) Natural
  - (C) Surgical
  - (D) Hormonal
41. Implantation occurs when the fertilized ovum
- (A) is in the oviduct
  - (B) reaches the uterus
  - (C) reaches the cervix
  - (D) becomes embedded in the uterus wall

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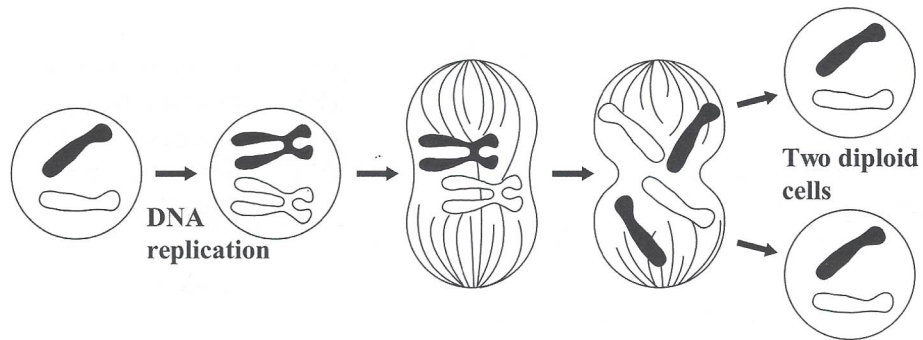
Item 42 refers to the following illustration of genetic engineering that is used to produce a useful protein.



42. What is a possible DISADVANTAGE of producing useful proteins in this way?
- (A) Production of protein is inexpensive.
  - (B) Large amounts of proteins can be made.
  - (C) Production of protein is very rapid as bacteria multiply.
  - (D) Use of bacteria in this process can be hazardous to health.

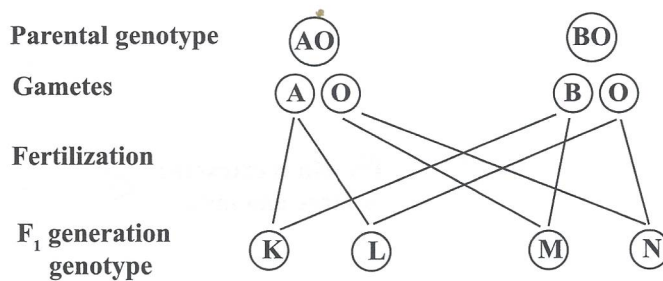
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Item 43 refers to the following diagram which shows a process that occurs in humans.



43. The process illustrated above is
- (A) mitosis
  - (B) meiosis
  - (C) cell transport
  - (D) cell transmutation
44. Which of the following occurs when a zygote receives ONE extra chromosome?
- (A) A gene mutation
  - (B) Sex-linked inheritance
  - (C) Incomplete dominance
  - (D) A chromosomal mutation

Item 45 refers to the following genetic cross which shows the inheritance of blood groups in humans. Alleles A and B are codominant to each other and both are dominant to O.

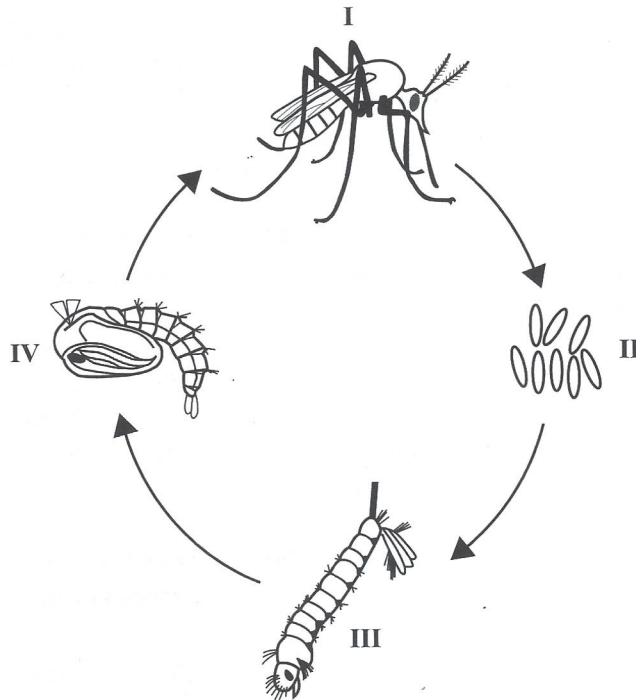


45. Which of the following offspring inherited the homozygous recessive allele?
- (A) K
  - (B) L
  - (C) M
  - (D) N

GO ON TO THE NEXT PAGE

46. Which of the following measures should an individual adopt to manage diabetes mellitus?
- I. Increase the carbohydrate intake
  - II. Adopt an active lifestyle
  - III. Lose weight
- (A) I and II only
  - (B) I and III only
  - (C) II and III only
  - (D) I, II and III
47. Which of the following types of immunity occurs when a baby receives antibodies from its mother before birth?
- (A) Natural active
  - (B) Natural passive
  - (C) Artificial active
  - (D) Artificial passive
48. Sickle-cell anaemia is classified as
- (A) a chronic disease
  - (B) an inherited disorder
  - (C) a nutritional deficiency disease
  - (D) a sexually transmitted infection
49. Which of the following organisms is the causative agent for cholera?
- (A) Virus
  - (B) Fungus
  - (C) Flatworm
  - (D) Bacterium
50. Which of the following statements about herpes is true?
- (A) Herpes is caused by bacteria.
  - (B) Herpes does not affect fertility.
  - (C) There is no known cure for herpes.
  - (D) The newborn child of a herpes sufferer cannot be infected.

Item 51 refers to the following diagram which shows the stages in the life cycle of the mosquito.



51. Which of the following stages are found in **or** on water?

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

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52. What is the effect of carbon monoxide on the human body?

- (A) Prevents oxygen uptake by blood
- (B) Damages cilia present on the trachea
- (C) Causes eye irritation and reduced visibility
- (D) Has toxic effects on the nervous system

53. Beriberi is an example of a disease that is classified as

- (A) hereditary
- (B) pathogenic
- (C) sexually transmitted
- (D) nutritional deficiency

54. Antiretroviral drugs are used to
- (A) cure HIV/AIDS
  - (B) cure pneumonia
  - (C) prevent secondary infections
  - (D) control the reproduction of HIV

55. Which of the following methods are effective in controlling pollution?

- I. The recycling of waste material
- II. The cleaning of rivers and streams
- III. The use of nuclear energy sources

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

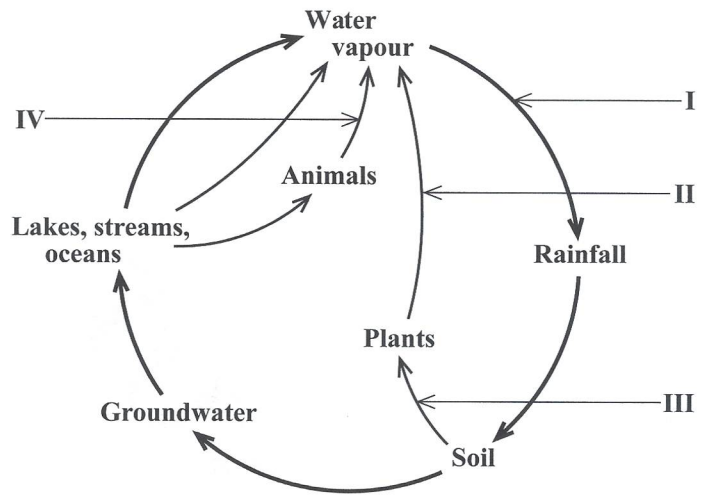
56. Chlorine bleach can be added to drinking water to

- (A) improve the taste
- (B) prepare it for filtration
- (C) destroy microorganisms
- (D) remove unpleasant smells

57. Which of the following gases is produced in a landfill site?

- (A) Ozone
- (B) Steam
- (C) Oxygen
- (D) Methane

Item 58 refers to the following diagram of the water cycle.



58. Transpiration is represented by

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

59. Which of the following is an example of a **non-biodegradable** pollutant?

- (A) Lead
- (B) Paper
- (C) Cotton
- (D) Sewage

60. Contamination of water sources is detrimental to humans because of the spread of water-borne diseases such as

- (A) rabies
- (B) cholera
- (C) influenza
- (D) tuberculosis

END OF TEST

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

## CANDIDATE'S RECEIPT

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### INSTRUCTIONS TO CANDIDATE:

1. Fill in all the information requested clearly in capital letters.

TEST CODE: 

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SUBJECT: HUMAN AND SOCIAL BIOLOGY – Paper 01

PROFICIENCY: GENERAL

REGISTRATION NUMBER: 

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FULL NAME: \_\_\_\_\_  
(BLOCK LETTERS)

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

2. Ensure that this slip is detached by the Supervisor or Invigilator and given to you when you hand in this booklet.
3. Keep it in a safe place until you have received your results.

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### INSTRUCTION TO SUPERVISOR/INVIGILATOR:

Sign the declaration below, detach this slip and hand it to the candidate as his/her receipt for this booklet collected by you.

I hereby acknowledge receipt of the candidate's booklet for the examination stated above.

Signature: \_\_\_\_\_  
Supervisor/Invigilator

Date: \_\_\_\_\_