**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.

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**FORM TP 2021013**

TEST CODE **01253010**

JANUARY 2021

# CARIBBEAN EXAMINATIONS COUNCIL

## CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

## HUMAN AND SOCIAL BIOLOGY

**Paper 01 – General Proficiency**

***1 hour 15 minutes***

**15 JANUARY 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.

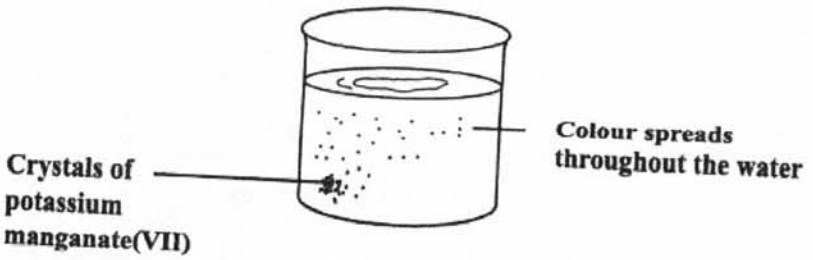
**DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.**

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1. In which of the following cell structures does photosynthesis take place?

(A) Ribosome
(B) Golgi body
(C) Chloroplast
(D) Mitochondrion

Items 2–3 refer to the following diagram showing the process that occurs when crystals of potassium manganate(VII) are placed in a beaker of water.




2. The process that allows the colour to spread throughout the water is called

(A) osmosis
(B) diffusion
(C) absorption
(D) active transport

3. In the human body, the process demonstrated in the diagram above occurs between the

(A) skin and hair
(B) blood and the brain
(C) trachea and the oesophagus
(D) alveoli and blood capillaries

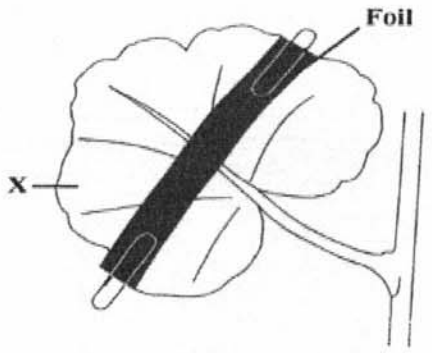
Item 4 refers to the following food chain.

Phytoplankton → zooplankton → jellyfish → turtle

4. In the food chain above, the primary producer is the

(A) turtle
(B) jellyfish
(C) zooplankton
(D) phytoplankton

Item 5 refers to the following diagram showing a leaf from a de-starched potted plant.




5. The plant is exposed to the sunlight for a few days and the leaf is removed and tested for starch. The colour of the part labelled **X** would MOST likely be

(A) blue-black
(B) brown
(C) green
(D) white

Items 6–7 refer to the following information on body mass index (BMI).

| Person | Height (m) | Weight (kg) | BMI |
|---|---|---|---|
| I | 1.45 | 36 | 17 |
| II | 1.55 | 54 | 22 |
| III | 1.65 | 75 | 27 |
| IV | 1.75 | 103 | 33 |

The BMI categories are as follows:

| | |
|---|---|
| Underweight | <18.5 |
| Normal weight | 18.5–24.9 |
| Overweight | 25–29.9 |
| Obese | >30 |

6. Which of the persons above is considered overweight?

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

7. The person in the normal weight category has a weight (in kg) of

(A) 36
(B) 54
(C) 75
(D) 103

8. Which of the following diseases is caused by a lack of vitamin A?

(A) Scurvy
(B) Rickets
(C) Beri-beri
(D) Night blindness

9. Which of the following is used to test for sugar in cereal?

(A) Biuret reagent
(B) Iodide solution
(C) Benedict's solution
(D) Grease spot emulsion

10. Water is required by all living things in order to

(A) dissolve fats
(B) break down fibre
(C) transport substances
(D) dissolve vitamins A and D

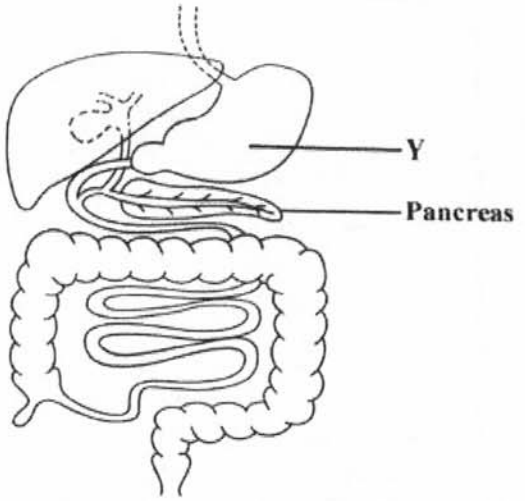
11. Diarrhoea MOST likely leads to

(A) headache
(B) dehydration
(C) constipation
(D) poor hygiene

12. A sample of pepsin taken from the stomach will NOT function in the small intestine because the

(A) small intestine is acidic
(B) stomach juice is alkaline
(C) action of pepsin is affected by temperature
(D) small intestine has a different pH from the stomach

Item 13 refers to the following diagram of part of the human digestive system.




13. The part labelled **Y** is responsible for the digestion of

(A) fats
(B) sugar
(C) starch
(D) protein

14. Which of the following foods is an excellent source of iron?

(A) Egg
(B) Liver
(C) Carrot
(D) Broccoli

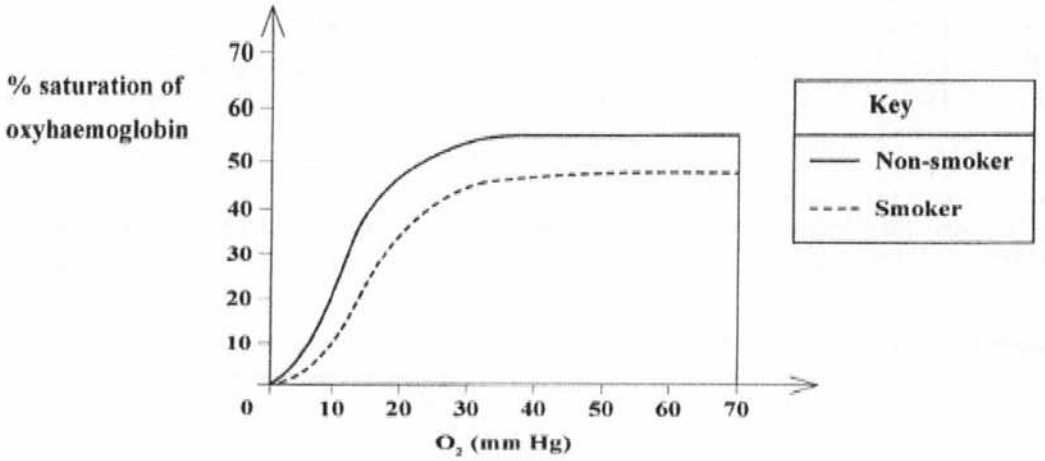
15. Which of the following structures of the tooth provides a surface for biting and crushing food?

(A) Root
(B) Crown
(C) Cement
(D) Pulp cavity



GO ON TO THE NEXT PAGE

Item 16 refers to the following graph.




16. Which statement BEST explains the data illustrated by the graph?

(A) Smoking reduces the oxygen-carrying capacity of blood.
(B) Smoking increases the oxygen-carrying capacity of blood.
(C) Smoking does not affect the oxygen-carrying capacity of blood.
(D) Smoking increases and then decreases the oxygen-carrying capacity of blood.

Item 17 refers to the following diagram which shows the final stages of the procedure for mouth-to-mouth resuscitation.



17. What is the FIRST step that must be taken in order to perform the procedure successfully?

(A) Pinch the person's nostrils to prevent air from escaping.
(B) Place the person on his stomach with his head tilting downwards.
(C) Place the person on his back and press back his forehead with one hand.
(D) Take a deep breath and start breathing into the person's mouth immediately.

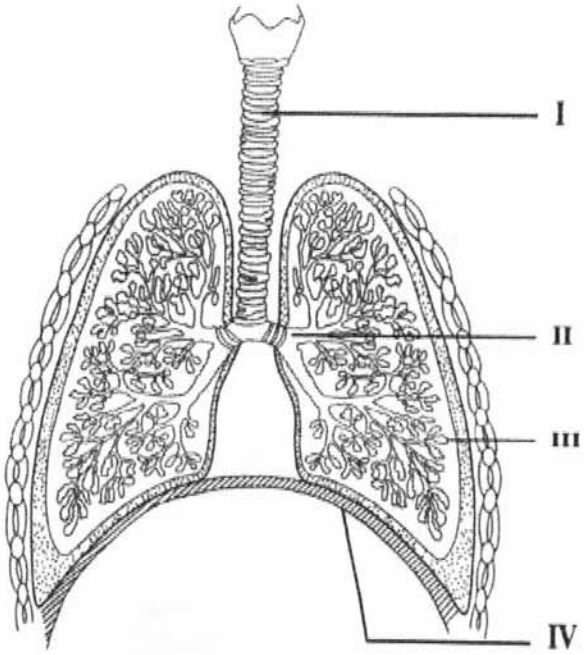
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**18.** Which of the following are dependent on **anaerobic** respiration?

I. The preparation of dough used in the baking of bread
II. The use of vinegar as a safe alternative to harsh cleaning agents
III. The fermentation of fruits to produce home-made wine

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

Item 19 refers to the following diagram of part of the human respiratory system.




**19.** Gaseous exchange takes place at

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

**20.** The oxygen-carrying capacity of red blood cells is facilitated by the

(A) presence of platelets
(B) presence of haemoglobin
(C) size of the red blood cells
(D) absence of nuclei in the cells

**21.** The function of valves in the heart is to

(A) lower the pressure of blood
(B) increase the pressure of blood
(C) prevent the back flow of blood
(D) push the blood back to the heart

**22.** Which of the following components of blood transports urea?

(A) Plasma
(B) Platelet
(C) Red blood cell
(D) White blood cell

**23.** The human circulatory system transports

(A) nutrients, heat and fibre
(B) oxygen, hormones and glycogen
(C) nutrients, nitrogenous waste and oxygen
(D) oxygen, starch and nitrogenous waste

**24.** Which of the following is a function of the lymph nodes?

(A) Coagulation of blood
(B) Production of plasma proteins
(C) Maintenance of extracellular fluid homeostasis
(D) Filtration and destruction of harmful organisms

**25.** Which of the following statements about the adaptations of the skeleton for movement are true?

I. The skeleton provides a framework for the attachment of muscles.
II. Joints present between limb bones allow movement to occur when muscles contract.
III. Limb bones act as levers for body movement.

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

**26.** Which of the following is the MOST severe damage caused by the prolonged wearing of high-heeled shoes?

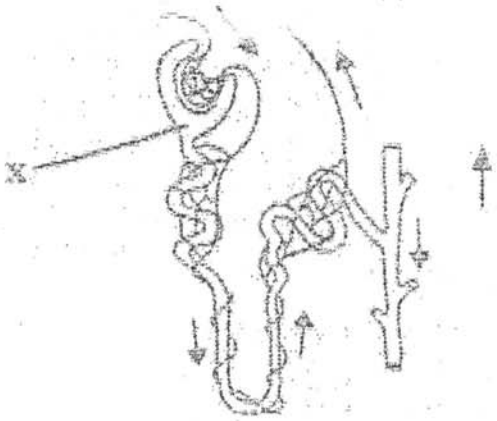
(A) Misalignment of the bones in the feet
(B) Widening of the spaces between the toes
(C) Development of corns and calluses on the toes
(D) Reduction of the support placed on the heels of the feet

**27.** A ball-and-socket joint is located

(A) at the elbow
(B) between wrist bones
(C) between the skull and the neck
(D) where the arm meets the shoulder

GO ON TO THE NEXT PAGE

Item 28 refers to the following diagram of a structure found in the kidney.




28. The part labelled X is the

(A) proximal convoluted tube
(B) Bowman's capsule
(C) loop of Henle
(D) glomerulus

29. The MAIN function of the vertebral column is to

(A) protect the spinal cord
(B) produce red blood cells
(C) facilitate muscle attachment
(D) support the girdles in the body

30. The ability of the human body to maintain a constant internal environment is called

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

31. The area of the brain which acts as a thermostat in the regulation of body temperature is the

(A) cortex
(B) cerebellum
(C) hypothalamus
(D) medulla oblongata

32. One of the functions of the kidney is to

(A) form urine
(B) absorb bile
(C) pump blood to the lungs
(D) reduce blood sugar levels

33. The BEST treatment for a cataract of the eye is the

(A) use of convex lenses
(B) use of concave lenses
(C) intake of daily supplements of vitamin A
(D) replacement of the eye lens by means of surgery

34. Which of the following is NOT true of a voluntary action?

(A) A nerve impulse has to be started in the brain.
(B) A person has to actively decide to make a movement.
(C) A movement or action is unconsciously performed all the time.
(D) A nerve impulse will pass down the white matter of the spinal cord.



GO ON TO THE NEXT PAGE

35. The way in which a lens brings about the fine focusing of objects is called

(A) myopia
(B) astigmatism
(C) conjunctivitis
(D) accommodation

36. The tough membrane which encloses the foetus and secretes a watery substance for its protection is called the

(A) uterus
(B) placenta
(C) amniotic sac
(D) umbilical cord

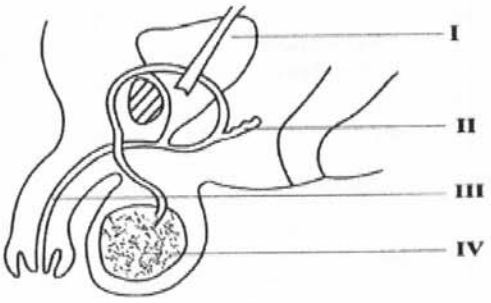
37. Which of the following glands produces follicle-stimulating hormone (FSH)?

(A) Ovary
(B) Thyroid
(C) Pancreas
(D) Pituitary

38. The region of the human brain that is responsible for balance and locomotion is the

(A) cerebrum
(B) cerebellum
(C) hypothalamus
(D) olfactory lobe

Item 39 refers to the following diagram showing the human male reproductive system.



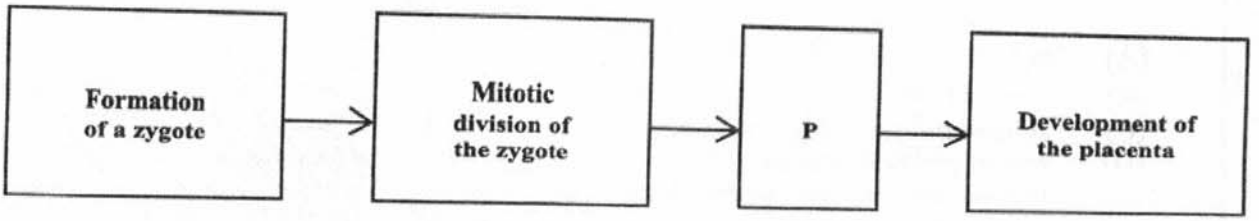

39. In which structure are spermatozoa produced?

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

40. Which of the following contraceptive methods is associated with side effects such as nausea, breast discomfort and circulatory problems?

(A) Pill
(B) IUD
(C) Diaphragm
(D) Female condom

Item 41 refers to the following stages in the development of an embryo, which occur after fertilization of the ovum.




41. Which of the following is Stage P?

(A) Implantation of the embryo
(B) Nourishment of the embryo
(C) Protection of the embryo
(D) Expulsion of the embryo

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42. In a multicellular organism, whenever cells need to be replaced, cells divide by

(A) fission
(B) mitosis
(C) meiosis
(D) fertilization

43. An example of discontinuous variation in humans is

(A) height
(B) foot length
(C) skin colour
(D) tongue rolling

44. Which of the following hormones is produced from bacteria that have been genetically engineered by humans?

(A) Insulin
(B) Thyroxine
(C) Testosterone
(D) Progesterone

45. If one parent is homozygous dominant for tallness and the other parent is heterozygous dominant for tallness, the possible genotypes of their offspring will be

(A) all TT
(B) ½ TT and ½ Tt
(C) ½ TT and ½ tt
(D) ¾ TT and ¼ Tt

46. Which of the following pests is classified as a vector?

(A) Rat
(B) Ant
(C) Locust
(D) Termite

47. In order to reduce the spread of ringworm, one should avoid

(A) sharing personal items and walking barefooted in changing rooms
(B) spitting and sneezing around others in a poorly ventilated room
(C) sharing utensils and having blood transfusions
(D) eating contaminated food in public places

48. Which of the following is classified as an infectious disease?

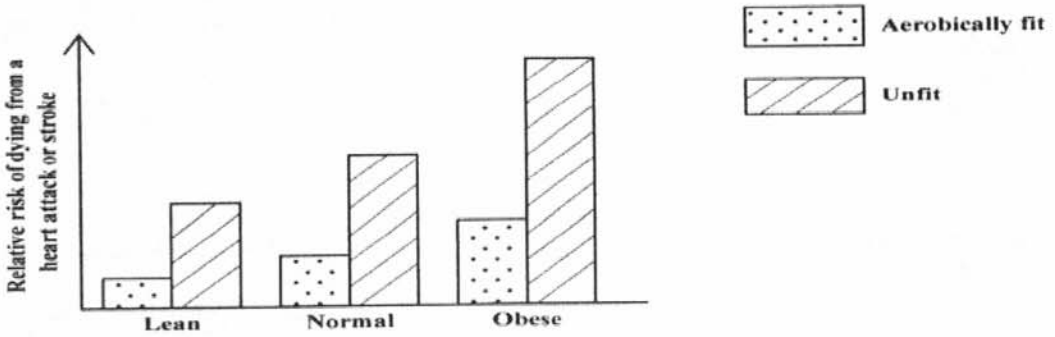
(A) Asthma
(B) Diabetes
(C) Influenza
(D) Hypertension

49. The drug heroin is an example of a

(A) steriod
(B) narcotic
(C) sedative
(D) stimulant

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Item 50 refers to the following bar chart which shows the risk of dying from a heart attack or stroke for lean, normal and obese persons.




50. Which of the following conclusions could be drawn from the graph?

I. Fit lean persons are least likely to suffer a heart attack.
II. Fit obese persons are less likely to suffer a heart attack than lean unfit persons.
III. Unfit normal persons are less likely to suffer a heart attack than unfit lean persons.

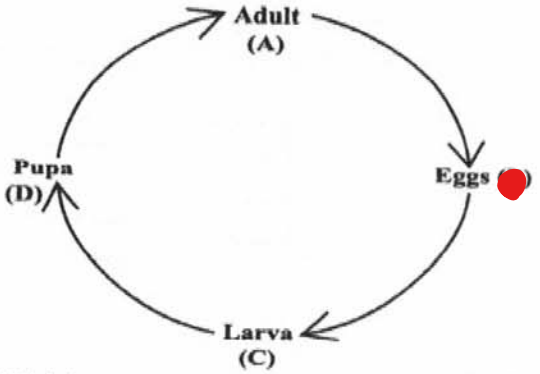
(A) I and II only
(B) I and III only
(C) II and III only
(D) I, II and III

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51. Which of the following is a method of slowing down the progress of HIV/AIDS in infected individuals?

(A) Encouraging them to have fewer sexual partners
(B) Encouraging them to use latex condoms during sexual activity
(C) Reducing their chances of coming into contact with infected blood
(D) Using drugs to treat the disease that occurs because their immune systems are damaged

Item 52 refers to the following diagram showing the life cycle of the housefly.




52. Which stage is prevented by keeping household refuse properly covered?

53. Immunity passed from mother to foetus by way of the placenta is described as

(A) natural active
(B) natural passive
(C) artificial active
(D) artificial passive

54. Which of the following organisms transmit the pathogen that causes malaria?

(A) Rats
(B) Houseflies
(C) *Anopheles* mosquitoes
(D) *Aedes aegypti* mosquitoes

55. After a storm, which method should NOT be used to make water safe for drinking?

(A) Using a fine strainer
(B) Using chloramine tablets
(C) Boiling for at least five minutes
(D) Adding a small amount of bleach

56. A pit latrine can affect water quality by

(A) encouraging the breeding of mosquitoes
(B) encouraging rodents to frequent water sources
(C) allowing the seepage of raw sewage into the water table
(D) causing the discolouration of water in wells, streams and rivers

57. Which of the following phrases BEST describes **non-biodegradable** pollutants?

(A) Broken down by chemicals to less harmful materials
(B) Can be broken down by sunlight to less harmful materials
(C) Broken down by living organisms to less harmful materials
(D) Unable to be broken down by living organisms to less harmful materials

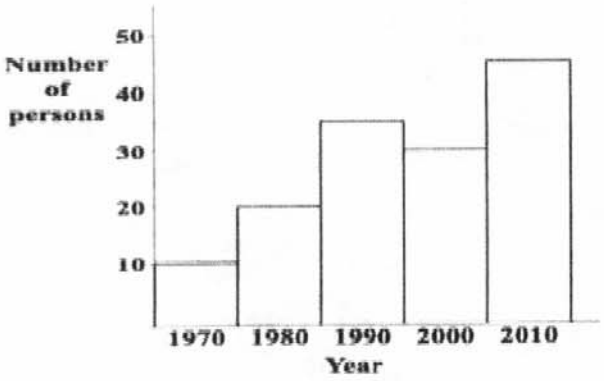


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**58.** Agricultural pollutants lead to

(A) smog
(B) acid rain
(C) eutrophication
(D) global warming

Item 59 refers to the following graph which shows the incidence of respiratory diseases in a community located close to a landfill.




**59.** The number of persons suffering from respiratory diseases between 1990 and 2010 is

(A) 35
(B) 45
(C) 100
(D) 110

**60.** A landfill can be BEST defined as an area

(A) in which solid wastes are spread out in thin layers and compacted
(B) in which garbage and sewage are dumped
(C) which is filled with dirt and other material
(D) in which sewage is treated

**END OF TEST**

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