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CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

HUMAN AND SOCIAL BIOLOGY

Paper 02 – General Proficiency

2 hours

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of SIX questions in TWO sections.
2. Answer ALL questions.
3. Write your answers in the spaces provided in this booklet.
4. Do NOT write in the margins.
5. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
6. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

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

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SECTION A

Answer ALL questions.

1. (a) Prostate cancer is one of the main cancers that affects the male reproductive system.

(i) Name ONE other cancer that affects the male reproductive system.

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(1 mark)

(ii) List THREE signs or symptoms of prostate cancer.

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(3 marks)

(iii) Identify TWO risk factors for developing prostate cancer.

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(2 marks)

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(b) Table 1 shows the responses of men in the Caribbean to a survey about their beliefs concerning prostate cancer.

TABLE 1: RESULTS OF SURVEY

Variable (Belief)	Strongly Agree (%)	Agree (%)	Disagree (%)	Strongly Disagree (%)
I can reduce my risk of getting prostate cancer.	7	17	60	16
Prostate cancer testing is embarrassing for me.	28	49	14	9
Prostate cancer cannot be treated once it is discovered.	19	50	21	10
Only elderly men get prostate cancer.	61	15	16	4

(i) Using the data in Table 1, state THREE reasons why the mortality rates for prostate cancer in the Caribbean are high.

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(3 marks)

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(ii) At the age of 43, Paul, a husband and father of three teenaged sons, was diagnosed with late-stage prostate cancer. He was treated for two years but eventually died. Suggest THREE ways in which Paul's early death could have impacted his family.

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(3 marks)

(iii) Recommend THREE strategies that governments can utilize to help Caribbean men overcome their fears and misbeliefs about prostate cancer.

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(3 marks)

Total 15 marks

2. (a) Figure 1 shows the processes of meiosis and mitosis.

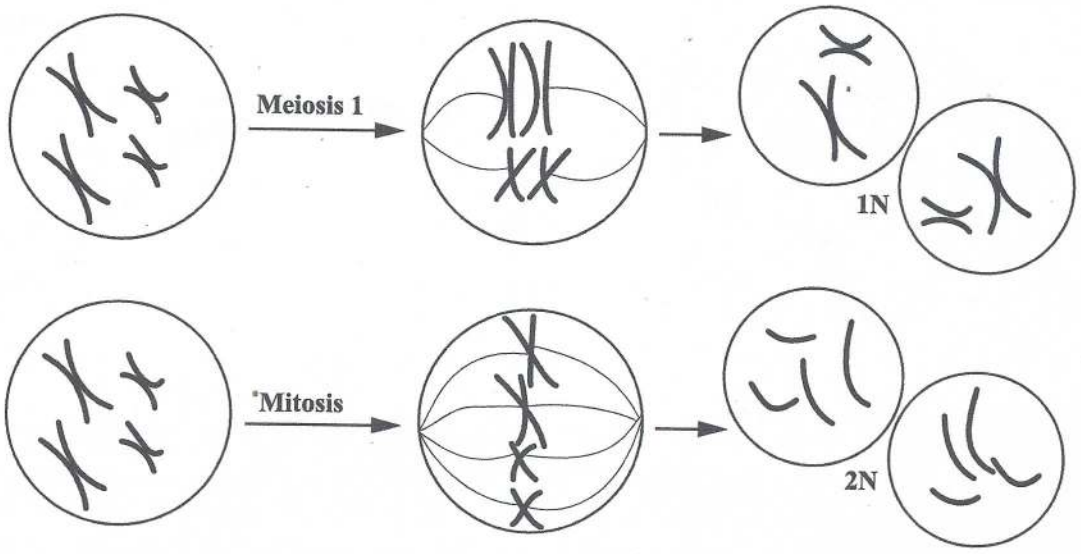


Figure 1. Processes of meiosis and mitosis

(i) From Figure 1, state ONE similarity between meiosis and mitosis.

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(1 mark)

(ii) From Figure 1, outline ONE difference between meiosis and mitosis.

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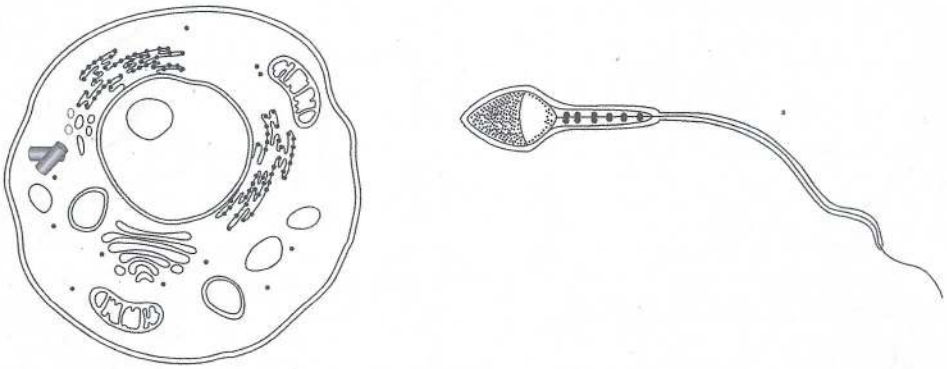
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(2 marks)

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(b) Figure 2 shows two types of cells, A and B, that are found in the human body.



Cell A **Cell B**

Figure 2. Human cells

(i) Identify the cell in Figure 2 which is produced as a result of meiosis.

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(1 mark)

(ii) Explain why meiosis is important in the production of the cell identified in b (i).

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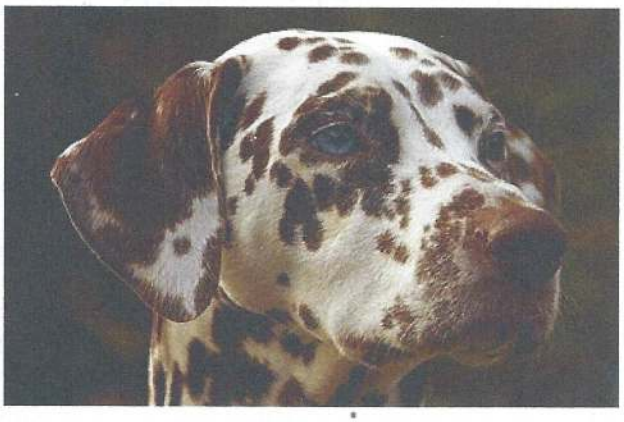
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(2 marks)

(c) Figure 3 shows images of a homozygous female and a heterozygous male Dalmatian dog who have mated to produce offspring.



Female parent (homozygous)



Male parent (heterozygous)

Figure 3. Male and female Dalmatian dogs

(i) Using the information below, draw a Punnett square to determine the possible genotypes of the offspring which would be produced from the Dalmatian parents in Figure 3.

Dominant allele for black spot colour = *B*
Recessive allele for brown spot colour = *b*

(4 marks)

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(ii) In Dalmatian dogs, there are only two colours for their spots, black or brown.

Identify this type of variation and state TWO examples of this type of variation seen in humans.

Type of variation .....

Examples .....

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(3 marks)

(iii) One of the offspring of the Dalmatians was completely white. Explain what caused this absence of colour to occur.

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Total 15 marks

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3. (a) List THREE substances transported by blood.

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(3 marks)

(b) State ONE function of EACH of the following components of blood.

(i) White blood cells

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(ii) Plasma

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(iii) Platelets

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(3 marks)

(c) Tanisha is carrying out a blood test in a medical laboratory.

(i) Identify the reagent she should use to test for glucose in the blood.

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(1 mark)

(ii) If there is glucose present, state the colour of the precipitate that would be observed.

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(1 mark)

(d) Leon has a deficiency in a particular vitamin. He cut his arm in an accident and his wound would not stop bleeding.

(i) Identify the vitamin that Leon is lacking and explain its role in preventing excessive blood loss.

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(3 marks)

(ii) Figure 4 shows the blood cells found in Leon's twin sister Deon, who is often very tired.

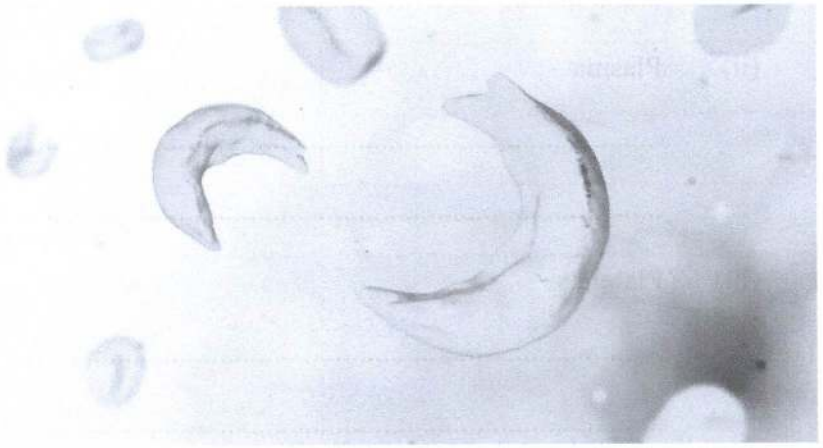


Figure 4. Deon's blood cells

Suggest the disease that Deon is suffering from and explain why she often feels very tired.

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(4 marks)

Total 15 marks

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4. (a) Define the term 'balanced diet'.

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(2 marks)

(b) Macronutrients and micronutrients are required for good health. State ONE function of EACH of the following nutrients in the body.

(i) Proteins

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(ii) Vitamin A

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(iii) Iron

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(iv) Calcium

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(4 marks)

(c) (i) Mrs Barton prepared a meal of peas and rice and fried chicken for her family's dinner. Identify the TWO Caribbean food groups missing from the meal.

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(2 marks)

(ii) Mrs Barton has 16-year-old twin girls, Kelly and Mandy. Kelly is very active and trains daily as she is on the track team. Mandy spends all her free time sitting at the computer playing games.

Recommend TWO ways in which the twins' diets should differ, stating ONE reason for EACH recommendation.

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(4 marks)

(iii) Kelly and Mandy are very worried about their friend Brian. Even though he is quite slender, Brian believes that he is too fat. He eats very small amounts of food and keeps losing weight.

Suggest the disease that Brian is suffering from and state TWO other signs or symptoms he may exhibit.

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(3 marks)

Total 15 marks

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SECTION B

Answer ALL questions.

5. (a) Dominic's class visited a landfill to observe its operation. He was pleasantly surprised to see how different the landfill was, compared to the dump near his house.

(i) Outline ONE difference between a dump and a landfill.

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(2 marks)

(ii) State TWO processes that occur in a landfill, giving ONE reason why EACH process is carried out.

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(4 marks)

(b) The garbage collection from Dominic's village is very unreliable. As a result, the villagers dispose of their garbage in a nearby dump. Dominic and his relatives plan to set an example by reducing the amount of garbage thrown away in their households.

(i) Recommend FIVE ways in which Dominic's family could reduce the amount of garbage thrown away.

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(5 marks)

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(ii) Suggest TWO social benefits and TWO economic benefits that could be gained from reducing the amount of garbage thrown away.

Social benefits .....

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Economic benefits .....

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(4 marks)

Total 15 marks

6. (a) The circulatory system is made up of the heart, blood vessels and blood. It does not depend on the nervous system for its impulses but instead generates its own impulses.

Identify the structure in the heart which is responsible for the generation of impulses and state in which chamber of the heart it is located.

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(2 marks)

(b) Poor lifestyle practices can contribute to the development of atherosclerosis, which can lead to high blood pressure.

(i) Describe how atherosclerosis causes an increase in an individual's blood pressure.

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(3 marks)

(ii) Identify ONE poor lifestyle practice that can contribute to the development of high blood pressure.

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(1 mark)

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(c) It is often said that "an obese child results in an obese adult".

Discuss the link between obesity in children and hypertension in adults, and suggest ONE way in which the incidence of **both** of these lifestyle diseases can be reduced.

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(5 marks)

(d) A consistently elevated blood pressure is as a result of the heart working much harder than usual to pump blood throughout the body.

Explain the changes that occur in the heart due to a consistently elevated blood pressure.

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(4 marks)

Total 15 marks

END OF TEST

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

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