



SIR ARTHUR LEWIS COMMUNITY COLLEGE
ACADEMIC YEAR (2024/2025) – SEMESTER ONE
END OF SEMESTER EXAMINATION

COURSE TITLE : SUSTAINABLE CITIES

COURST CODE : ENV237

**LECTURER : DR. MARIE LOUISE FELIX
YVETTE TALA CHARLES**

DATE : Thursday 19th December 2024

TIME : 9.00 – 11.00 AM

DURATION : 2 hrs

STUDENT ID# :

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. **This paper consists of two (2) sections.**
2. Answer **ALL** questions in part I and II.
3. Specific instructions are given at the beginning of each section.
4. Ensure that your College Identification Number is on every sheet of paper that you submit.

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

Section I: Multiple Choice

(Total 20 marks)

Answer all questions. There is only one correct answer per question.

1. “Urban areas have lower ecological footprints compared to rural areas”. According to your knowledge, this statement is:

- (A) TRUE (B) FALSE

2. How many goals and targets does the Sustainable Development Goals comprise of?

- (A) 17 goals and 132 targets (B) 17 goals and 169 targets
(C) 15 goals and 132 targets (D) 15 goals and 169 targets

3. Over the last 30 years, the proportion of people living in urban areas have increased in which of the following areas?

- (A) North America, South America, and Asia only
(B) All continents but Africa.
(C) All continents.
(D) All continents but Europe and Africa.

4. Much of the growth in human population in this century is expected to take place in which of the following areas?

- (A) Rural Africa
(B) Rural Asia and South America.
(C) Current large urban areas of developing nations.
(D) All the above.

5. Urban sprawl is characterized by

- (A) dominance of freeways and cars.
(B) leapfrog development, reducing farmland and natural areas.
(C) low-density residential development.
(D) all of the above.

6. Cities with populations greater than 10 million people

- (A) do not exist in the developed world. (B) are located primarily in East Asia.
(C) are referred to as megacities. (D) none of the above is correct.

7. _____ of urban residents in developing countries have satisfactory sanitation services.

- (A) Nearly all (B) 70-80%
(C) Less than half (D) 55 – 65%

8. Which of the following is NOT a characteristic of a circular economy?

- (A) Treatment and disposal of waste.
(B) Eliminate waste and pollution.
(C) Circulate products and materials (at their highest value).
(D) Regenerate nature.

Study the graph below and answer question 9, which follows.

Figure 1 shows the size of the population of a Caribbean country during the period 1840 to 2000.

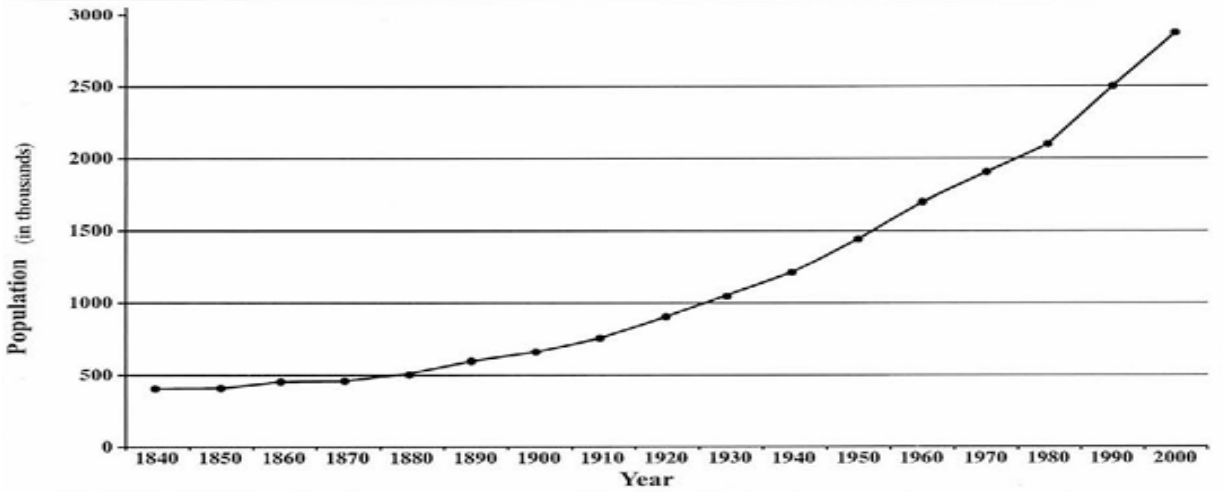


Figure 1. Population of a Caribbean Country

9. From 1900 to 2000, the population of this Caribbean country

- (A) Increased by 200%
- (B) Increased by 85%
- (C) Increased by 300%
- (D) None of the above

Study the graph below and answer the question which follow.

Figure 2. shows the variation of coral cover between 1970 and 2000 for a Caribbean island. Tests on the coastal waters indicate high levels of turbidity and faecal coliform.

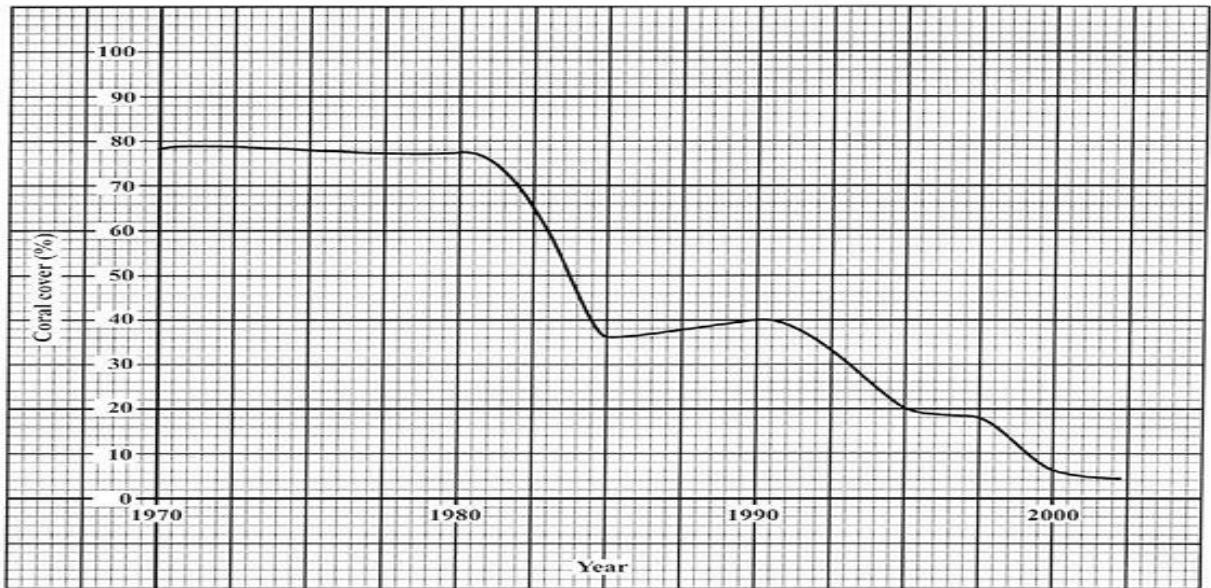


Figure 2. Variation in coral cover

10. Based on the graph, ALL EXCEPT ONE of the following deductions may be made with regards to “Water pollution in this Caribbean island”:

- (A) Probably commenced before 1980.
- (B) Is unlikely to be related to coral cover.
- (C) Is increasing significantly.
- (D) May be land-based.

11. Which of the following is an indicator of unsustainable population expansion?

- (A) Low biodiversity of plants and animals
- (B) Overexploitation of resources like water and energy
- (C) Balanced birth and death rates
- (D) Effective public transportation systems

12. Which of the following is a social problem arising from rapid population growth in urban areas?
- (A) Increase in crime and violence
 - (B) Increased biodiversity
 - (C) Increase in air pollution
 - (D) Overuse of natural resources
13. All of the following are effects of perceived high employment opportunities in urban areas EXCEPT?
- (A) It encourages migration into the cities.
 - (B) It puts a strain on the existing health infrastructure.
 - (C) It increases urbanization and slum development.
 - (D) Promotes agricultural expansion in rural areas.
14. All of the following reasons account for urbanization EXCEPT?
- (A) Rent is more affordable in urban areas.
 - (B) Urban areas have better healthcare and educational facilities.
 - (C) There are more jobs available in urban areas.
 - (D) There are more opportunities for entertainment in urban areas.
15. Which of the following can help reduce solid waste at the source?
- (i) composting of food wastes
 - (ii) Packaging items with less material
 - (iii) increasing landfill space
 - (iv) creating more durable products.
- | | |
|----------------------------|---------------------------|
| (A) (ii) and (iv) only | (B) (iii), (iv) only |
| (C) (ii), (iii), (iv) only | (D) (i), (iii), (iv) only |
16. Which of the following is an environmental consequence of unsustainable urban growth?
- (A) Decrease in greenhouse gas emissions
 - (B) Deforestation and loss of natural habitats
 - (C) Improved public infrastructure
 - (D) Increased availability of natural resources
17. Which of the following is NOT an ecosystem service provided by marine ecosystems?
- (A) Oxygen production
 - (B) Global temperature regulation
 - (C) Habitat for animals
 - (D) Coastal protection from high tides
18. Which of the following BEST describes sustainable marine tourism?
- (A) Maximizing tourist numbers regardless of environmental impact
 - (B) Prohibiting all tourism activities in marine areas
 - (C) Balancing environmental protection with tourism activities
 - (D) Prioritizing revenue generation from tourism
19. Which of the following activities is a significant cause of coastal habitat destruction?
- (A) Aquaculture and recreational fishing
 - (B) Coastal construction and urbanization
 - (C) Marine based tourism activities
 - (D) Regulation of shipping lanes

20. Which of the following is the main cause of coastal eutrophication?
- (A) Climate change and global warming
 - (B) Excessive nutrient runoff from agriculture
 - (C) Overfishing in coastal waters
 - (D) Marine plastics and oil spills

Section II: Structured Questions

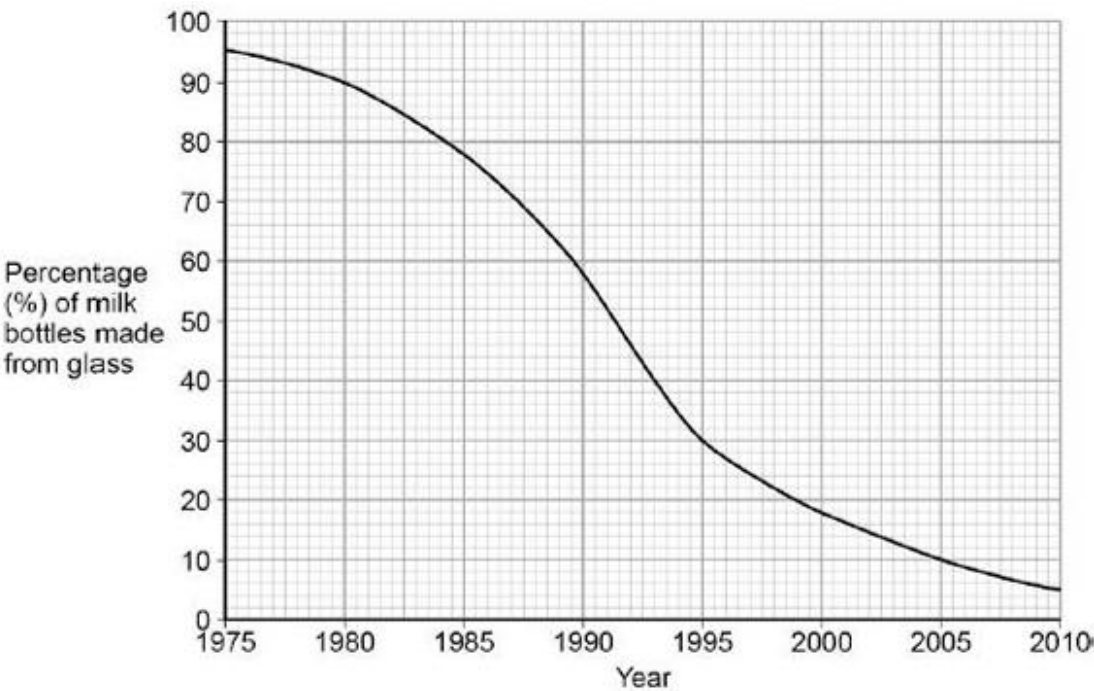
(Total 60 marks)

Answer ALL questions.

Question 1

Study the graph below and answer the following questions. Both plastic and glass can be used to make milk bottles.

Figure 3. below shows the percentage of milk bottles made from glass between 1975 and 2010



- (A) Describe the trend in Figure 3. above. (1 mark)
- (B) In what year did the percentage of milk bottles made from glass decline by 50% of the 1975 figure? (1 mark)
- (C) Give ONE reason for the trend observed. (1 mark)
- (D) Give ONE possible environmental impact because of the trend depicted in Figure 3. above. (1 mark)

Use the table below to answer the questions that follow.

The table below gives information about milk bottles

	Glass milk bottle	Plastic milk bottle
Raw materials	Sand, limestone, salt	Crude oil
Bottle material	Soda-lime glass	HD poly(ethene)
Initial stage in production of bottle material	Limestone and salt used to produce sodium carbonate.	Production of naphtha fraction.
Maximum temperature in production process	1600 °C	850 °C
Number of times bottle can be used for milk	25	1

Size(s) of bottle	0.5 dm ³	0.5 dm ³ , 1 dm ³ , 2 dm ³ , 3 dm ³
Percentage (%) of recycled material used in new bottles	50 %	10 %

Evaluate the production and use of bottles made from soda-lime glass and those made from HD poly(ethene)

(E) Which material would you recommend as the best material for milk bottles? Use the information given and your knowledge and understanding to JUSTIFY your choice of materials for milk bottles. (4 marks)

Use the Information in Figure 4. to complete the table below.

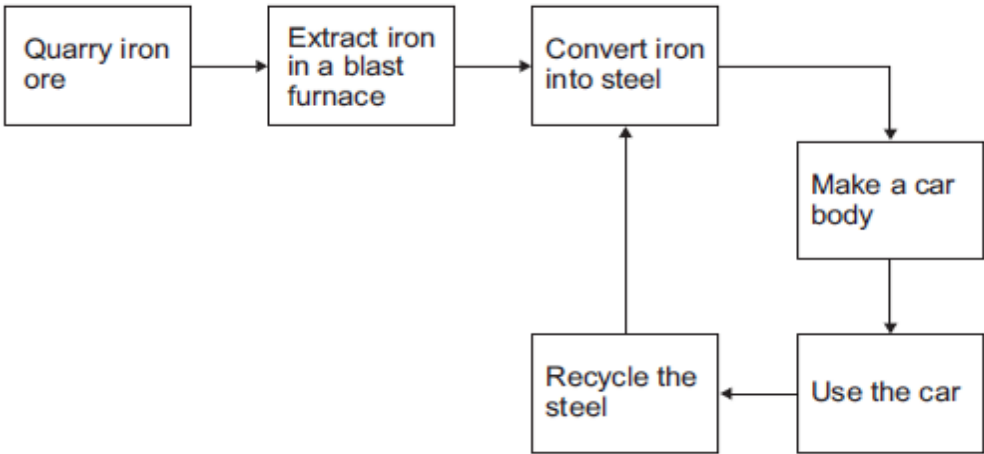


Figure 4. Life cycle of a car

(F) Copy and complete the table below by indicating the Life Cycle stage listed below. (Note: the life cycle stage may be used more than once.) (2 marks/ ½ mark each)

Life Cycle of the Car as per the diagram	Life Cycle Stage
Quarry iron ore	
Extract iron in a blast furnace	
Convert iron into steel	
Use the car	

Question 2

(A) Define the term “Blue Economy” (2 marks)

(B) Describe FOUR ways in which the Blue Economy can contribute to the overall economy of SIDS (Small Island Developing States). (4 marks)

(C) Describe FOUR human activities in Caribbean states that threaten the Blue Economy.
(4 marks)

Question 3

(A) Explain the meaning of the following terms

(i) “Pollution” (1 mark)

(ii) “Waste Management” (1 mark)

(B) Outline how EACH of the following may increase environmental pollution.

(i) Population growth (3 marks)

(ii) Economic development (3 marks)

(C) Describe TWO measures that a country like Saint Lucia may take to reduce pollution in urban areas.
(2 marks)

Question 4

(A) Define the terms “eco-city” and “urbanization” (2 marks)

(B) Describe TWO problems that an existing city may face as a result of rapid urbanization.
(4 marks)

(C) As an urban planner, describe TWO recommendations that you would make to the government to help reduce the problems mentioned in (B) above.
(4 marks)

Question 5

(A) Define the term “by-catch” as it relates to fishing. (1 mark)

(B) List TWO marine habitats that are present in the Caribbean. (2 marks)

(C) Describe TWO destructive fishing practices that commercial fishermen use to catch fish/seafood. (4 marks)

(D) You are aware of the negative effects of commercial fishing on fish populations, suggest ONE action that can be taken to help ensure that fish populations remain sustainable. (3 marks)

Question 6

(A) Differentiate between “circular economy” and “linear economy”. (2 marks)

(B) Explain ONE deficiency in a linear economy. (2 marks)

(C) Choose THREE pillars of a circular economy and explain how they can be used to make a city more sustainable. (6 marks)

END OF EXAMINATION