



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

COURSE CODE : ENV302
COURSE TITLE : Sustainable Build Environment
LECTURER(S) : Germaine Joseph
DATE :
TIME :
DURATION : 1 hr 30 minutes
STUDENT ID # : _____

GENERAL INFORMATION AND INSTRUCTIONS

- Students must sign **IN** and **OUT** on the examination class list.
- Write your ID number on the question paper.
- This paper has three Sections questions.
- Read each question carefully before choosing the appropriate answer or attempting a question.
- Silent, non-programmable calculator is required.

GOOD LUCK!

Question	Student's Mark	Moderated Mark
Section A 1 - 30		
Section B		
1		
2		
3		
4		
5		
Total		

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

Part A: Multiple Choice Questions (30 Marks). (Each question is worth 1 mark.)

Instruction: Circle the correct answer from A, B, C, or D on the question paper.

1. Which of the following best defines sustainable building design?
 - A. Designing buildings solely for aesthetic appeal
 - B. Prioritizing cost over environmental sustainability
 - C. Building structures without considering their environmental footprint
 - D. Incorporating renewable energy and efficient resource use to reduce environmental impact
2. Which of the following is an example of a renewable building material?
 - A. Cork
 - B. Steel
 - C. Concrete
 - D. Polyvinyl chloride (PVC)
3. What is the main goal of energy-efficient building systems?
 - A. To avoid using renewable energy systems
 - B. To prioritize aesthetics over energy savings
 - C. To reduce operational costs without considering energy use
 - D. To minimize energy consumption while maintaining comfort and performance
4. Which of the following describes the purpose of smart meters?
 - A. Monitoring indoor air quality
 - B. Detecting structural weaknesses in a building
 - C. Tracking appliance performance without energy data
 - D. Providing real-time data on energy consumption to improve efficiency
5. Which device is commonly used to detect moisture within building materials?
 - A. Barometer
 - B. Hygrometer
 - C. Moisture meter
 - D. Infrared thermometer
6. What does a thermal imaging camera detect in energy-efficient systems?
 - A. Soundproofing gaps
 - B. Structural integrity issues
 - C. Heat loss through building envelopes
 - D. Water pressure fluctuations and ruptures
7. What is a key feature of a LEED-certified building?
 - A. Use of only non-renewable resources
 - B. Absence of renewable energy systems
 - C. Implementation of sustainable and energy-efficient practices
 - D. Focus on low upfront costs regardless of environmental impact
8. Which certification focuses specifically on creating buildings with extremely low energy demand?
 - A. LEED
 - B. BREEAM
 - C. Passive House
 - D. WELL Building Standard
9. Which renewable energy system converts sunlight directly into electricity?
 - A. Wind turbines
 - B. Biomass generators
 - C. Photovoltaic systems
 - D. Geothermal heat pumps
10. Which of the following is not a component of a photovoltaic system?
 - A. Batteries
 - B. Inverters
 - C. Solar panels
 - D. Heat exchangers

11. Which factor significantly impacts Indoor Environmental Quality?
 - A. Paint color on walls
 - B. Availability of parking spaces
 - C. Use of synthetic flooring materials
 - D. Proper ventilation and natural light
12. State whether the following statement is True or False: "Poor indoor air quality can affect both the health and productivity of building occupants".
 - A. True
 - B. False
13. Which system helps detect excessive indoor humidity, a key factor in air quality?
 - A. Smoke detector
 - B. Infrared motion detector
 - C. Dehumidifier with sensors
 - D. Carbon monoxide detector
14. Which of the following strategies helps in water-efficient building design?
 - A. Rainwater harvesting systems
 - B. Avoiding water recycling systems
 - C. Using untreated water for irrigation
 - D. Increasing water pressure in pipes
15. What does a water efficiency audit primarily assess?
 - A. The lifespan of water storage tanks
 - B. The aesthetic appeal of water fixtures
 - C. The quantity of water consumed and wasted
 - D. The pressure in the building's plumbing system
16. How do smart meters support energy efficiency?
 - A. By manually controlling all energy inputs
 - B. By eliminating the need for energy audits
 - C. By providing only estimated energy consumption
 - D. By offering insights into energy use patterns for better management
17. What role do motion sensors play in energy-efficient building systems?
 - A. Controlling water pressure
 - B. Monitoring appliance performance
 - C. Turning off lights in unoccupied spaces
 - D. Tracking energy usage in HVAC systems
18. Which device is used to evaluate heat loss in a building's envelope?
 - A. Barometer
 - B. Hygrometer
 - C. Moisture meter
 - D. Thermal imaging camera
19. Which of the following is not a LEED category?
 - A. Sustainable Sites
 - B. Energy and Atmosphere
 - C. Neighborhood Development
 - D. Indoor Air Quality Optimization
20. Which category is not a listing for LEED certification?
 - A. Operations and Maintenance (O+M)
 - B. Interior Design and Construction (ID+C)
 - C. Building Design and Construction (BD+C)
 - D. Structural Engineering and Analysis (SEA)
21. Which renewable energy source uses heat from beneath the Earth's surface?
 - A. Wind energy
 - B. Solar energy
 - C. Biomass energy
 - D. Geothermal energy

22. State whether the statement is True or False: “Passive design strategies reduce reliance on mechanical systems by leveraging natural resources”.
 - A. True
 - B. False
23. What is the primary goal of smart city technologies in urban environments?
 - A. Expanding urban sprawl
 - B. Improving aesthetic appeal of buildings
 - C. Reducing resource use and improving efficiency
 - D. Minimizing energy regulations, laws and policies
24. Which smart device monitors air quality in real-time?
 - A. Barometer
 - B. Hygrometer
 - C. Smart air purifier
 - D. Smart dehumidifier
25. What is the function of energy-efficient glazing in buildings?
 - A. Blocking all natural light
 - B. Replacing traditional insulation
 - C. Increasing airflow within buildings
 - D. Allowing maximum sunlight without heat gain
26. What approach best represents the Circular Economy model in managing building materials?
 - A. Use and dispose
 - B. Reuse and recycle
 - C. Import new materials regularly
 - D. Single-use construction materials
27. Which of the following is a social benefit of sustainable building design?
 - A. Reduced emphasis on community spaces
 - B. Higher costs of living for nearby communities
 - C. Increased reliance on imported construction materials
 - D. Improved health and well-being of occupants through better indoor air quality
28. What is a critical challenge of integrating renewable energy into building design?
 - A. Decreased building life span
 - B. Limited options for energy-efficient systems
 - C. Reduced environmental benefits compared to fossil fuels
 - D. High initial installation costs and intermittent energy supply
29. Considering the goals of sustainable development in the Caribbean, which of the following best explains how the CARICOM Regional Energy Efficiency Building Code (CREEBC) supports regional climate resilience efforts?
 - A. By promoting architectural uniformity across the Caribbean for cultural preservation.
 - B. By mandating renewable energy use in every public and private building project.
 - C. By establishing performance-based energy efficiency standards that reduce building energy demand, thereby lowering carbon emissions and enhancing climate resilience.
 - D. By enforcing strict penalties for non-compliance with green certification across CARICOM countries.
30. What is the key difference between sustainable buildings and green buildings?
 - A. Sustainable buildings focus solely on energy efficiency, while green buildings address water efficiency.
 - B. Green buildings primarily focus on environmental impacts, while sustainable buildings consider environmental, social, and economic factors.
 - C. Sustainable buildings prioritize renewable materials, while green buildings focus on reducing construction costs.
 - D. Green buildings aim to achieve net-zero energy, while sustainable buildings ignore energy performance.

Part B: Short Answer Questions

(10 Marks)

Instruction: Answer all questions in the space provided.

1. Discuss, in detail, two potential risks or challenges cities might face when implementing Smart city technologies. (5 marks)

2. Identify and explain two key challenges in implementing green building standards in the Caribbean, considering economic, environmental, and social factors. (5 marks)

Part C: Long Answer Questions (30 Marks)

Instruction: Answer all questions in the space provided.

3. Based on Saint Lucia’s environmental and geographical conditions, recommend the most suitable renewable energy source with justification for your choice. (10 marks)

4. Critically evaluate the sustainability and pollution impacts of renewable energy and fossil fuels. *Use examples to support your judgement.* (10 marks)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

5. Describe three major strategies to improve water efficiency in sustainable buildings. Provide examples of technologies or practices used. (10 Marks)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

End of Examination