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0800MCN201122001



Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S3 (S,FE) (FT/WP/PT) Examination May 2025 (2019 Scheme)

Course Code: MCN201

Course Name: Sustainable Engineering

Max. Marks: 100

Duration: 3 Hours

PART A

Answer all questions. Each question carries 3 marks

Marks

- | | | |
|----|---|-----|
| 1 | (a) Define sustainability. | (2) |
| | (b) Draw the three pillar Venn Diagram for sustainability. Also mark the situation, if we achieve only two pillars of sustainability. | (1) |
| 2 | (a) Make a note of the key points of Clean Development Mechanism. | (2) |
| | (b) List any TWO declared aims of Clean Development Mechanism. | (1) |
| 3 | Explain with suitable example how do you apply the concept of three R's in your daily life. | (3) |
| 4 | "We should plant trees and nurture the ones already exists in our surroundings." Justify the statement with THREE arguments. | (3) |
| 5 | What is bio mimicking? Give one example. | (3) |
| 6 | a. Define Circular Economy. | (2) |
| | b. Why do we move to circular economy? List two reasons | (1) |
| 7 | What is a Fuel Cell? | (3) |
| 8 | What is Bio Fuel? | (3) |
| 9 | List any SIX simple ways to increase energy efficiency in your buildings. | (3) |
| 10 | Give any THREE examples of sustainable transport with proper reason for the selection. | (3) |

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

- | | | |
|----|---|-----|
| 11 | a. Explain how do COVID-19 affect the three pillars of sustainability. | (9) |
| | b. List any FIVE Millennium Development Goals. (No explanation is needed) | (5) |
| 12 | a. Describe any FOUR technological solutions to meet the goals of sustainability. | (8) |
| | b. List any SIX Sustainable Development Goals. (No explanation is needed) | (6) |

Module 2

- 13 a. Explain any TWO types of environmental pollution mentioning its causes, effects and remedies. (8)
- b. With help of TWO examples, explain how do our festival practices contribute to environmental pollution (4)
- c. Suggest ONE eco friendly alternative for each case (2)
- 14 a. Explain any TWO causes, TWO effects and TWO initiatives that can help to prevent global warming (9)
- b. What is Carbon Credit? (2)
- c. How can you make money from it? Give example. (3)

Module 3

- 15 a. Explain the four stages of Life cycle analysis. (8)
- b. With over 1.6 billion cups of coffee consumed a day worldwide, the choice of coffee cups can have an impact on our planet. What is the best choice in a restaurant- a paper cup or a ceramic cup? Justify your choice with a drawing indicating the life cycle diagram of a "Cup" from acquisition of raw materials to its end of life. (6)

(While analysing the choice, consider Environmental Profile, Direct cost of the Restaurant, quantities of water and soap, and mass of disposable cups only).

- 16 a. Describe how to carry out Environmental Impact Assessment. (5)
- b. A livestock production system requires Environmental Impact Assessment. List any FOUR impacts to be assessed. (2)
- c. What is Industrial Symbiosis? (2)
- d. Assume you have an Agricultural Farm which produces RICE in your area. Explain (or draw a flow diagram) how can you apply Industrial Ecology concept to generate zero waste by giving emphasis to Cattle Raising, Bio Fuel Industry, Transportation, Residential and Dry land agriculture in this farm. (5)

Module 4

- 17 a. Describe any THREE conventional and THREE non-conventional energy sources. (12)
- b. Write any ONE advantage and ONE disadvantage of conventional and non conventional energy sources. (2)

- 18 a. Explain the largest non-conventional energy source. Also list the advantages and disadvantages of it. (4)
- b. Describe the working of small hydro-electric power plants. (4)
- c. Explain the working of Geo-thermal plant and write any TWO benefits and TWO drawbacks of geo-thermal energy. (6)

Module 5

- 19 Assume that you are given 25 cents (10890 sq.ft) of land in tropical region and asked to lead a "green life" by constructing a green home with modern amenities including internet. Describe how will you achieve this? (14)
- (While answering, you are expected to give more emphasis on the construction materials, construction technology, energy efficient technologies, pollution reduction, waste management and the concept of 3R's).*
- 20 Choose any city known to you. Based on your choice, write any **FOUR** points to substantiate your answer for the following questions:
- a. Is sustainable development possible in your city? Justify. (2)
- b. What are the obstacles to sustainable development in your city? (6)
- c. How can these obstacles be removed so that sustainable development can be achieved in your city? (6)
