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Reg. No.: \_\_\_\_\_

Name: \_\_\_\_\_

FIRST SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2016

Course Code: BE103

Course Name: INTRODUCTION TO SUSTAINABLE ENGINEERING

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer all a OR b set questions; each question carries 5 marks*

A1. (a)

(i) What is sustainable development?

(2 marks)

(ii) Find the pairs.

(3 marks)

Set A: The Vienna Convention, International Union for Conservation of Nature, The Air Act

Set B: 1981, 1985, 1948.

**OR**

A1. (b) Write short note on need of environment sustainability.

A2. (a) Explain Zero Waste Concept.

**OR**

A2. (b) Explain 3R Concept.

A3. (a) The figure shows cradle to grave journey of a typical Jeans. State atleast one impact in each of the first 5 stage.



**OR**

A3. (b) A hospital is situated in the middle of a densely populated area. List out any three impacts that can happen to its surroundings and suggest any two methods to reduce it.

A4. (a) Write a short note on sustainable cities.

**OR**

A4. (b) (i) Give two ways to improve energy efficiency of buildings.

(3 marks)

(ii) Give a method adopted for maintaining a sustainable transport in our city.

(2 marks)

A5. (a) There is a remote village on the top of a hill. Explain any two methods that can be adopted there to generate electricity?

**OR**

A5. (b) Write a short note on fuel cells.

A6. (a) How can energy be derived from oceans?

**OR**

A6. (b) Cochin International Airport in Kerala, India, is going all in on Solar. 46,150 solar panels are powering the airport. What are the social, economic and environmental advantages of providing power from Solar Energy?

A7. (a) Illustrate industrial symbiosis with a suitable example. What are the major advantages of industrial symbiosis?

**OR**

A7. (b) Write a short note on Industrial Ecology

A8. (a) What are the main causes of urbanization? List any three urban problems affecting sustainability, faced by the MEDCs (Medium Economically Developed Countries).

**OR**

A8. (b) Write a short note on Green Engineering.

### **PART B**

**(Read the Stories/Cases/Data set as the case may be, and answer ALL questions.**

**Each FULL question carries 10 Marks)**

#### **Module I**

In a number of districts of India, Coca Cola and its subsidiaries are accused of creating severe water shortages for the community by extracting large quantities of water for their factories, affecting both the quantity and quality of water. Coca Cola has the largest soft drink bottling facilities in India. Water is the primary component of the products manufactured by the company. There have been numerous public protests of The Coca-Cola Company's operations throughout India, involving thousands of Indian citizens and several non-governmental organizations. Protests against the Coca Cola factories have taken place in a number of districts including: Kala Dera in Rajasthan; Thane in Maharashtra, Sivaganga in Tamil Nadu and Plachimada in Kerala.

B1. (a) Identify how this situation affects sustainability. (3 marks)

(b) If you have been entrusted with taking permanent solution, what all measure will you take? (3 marks)

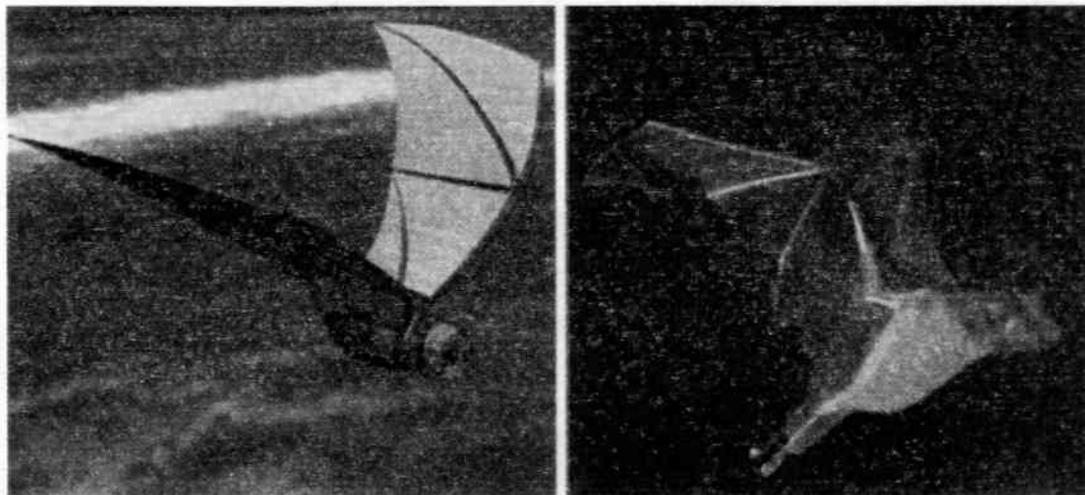
(c) Being a protestant bring out sample slogans and key message to address. (4 marks)

#### **Module II**

<b>City</b>	<b>Annual Mean Concentration of Particulate matter with diameter of 2.5 microns or less(<math>\mu\text{g}/\text{m}^3</math>)</b>
Patna	150
Lucknow	115
Gwalior	145
Raipur	130
New Delhi	190
Trivandrum	110
Srinagar	120
Beijing	320
Islamabad	170

- B2. (a) Identify the least and most polluted Indian city from the above table. (2 marks)  
 (b) Arrange Indian cities in the decreasing order of pollution. (2 marks)  
 (c) List out any three effects of air pollution. (3 marks)  
 (d) List out any three methods to control air pollution. (3 marks)

### Module III



- B3. (a) What does the figure represents? (1.5 marks)  
 (b) Give a brief explanation. (4 marks)  
 (c) Explain any three similar cases. (4.5 marks)

### Module IV

Read the conversation and answer the questions of B4.

Rohan was having his breakfast in classroom. Rahul was sitting next to him.

Rahul: Rohan, Today while I was going through the newspaper I met with a word "Green Building". Does it means a building which is green in colour

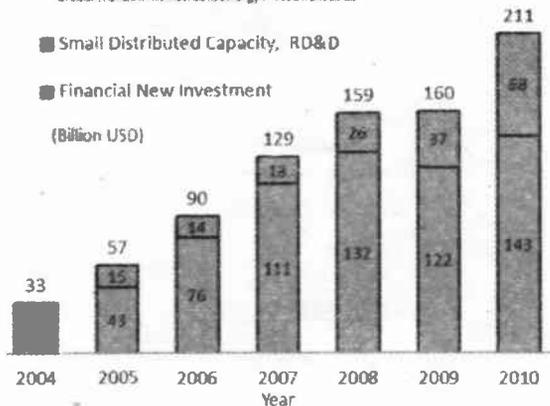
Rohan: I don't think so. Come let's ask Prof. Thomas.

- B4. (a) Assume that you are Prof. Thomas. What will be your answer to Rahul's question? (3 marks)  
 (b) List out any four criteria for selecting a green material. (4 marks)  
 (c) Comment on green building certification. (3 marks)

### Module V

Global new investment in renewable energy

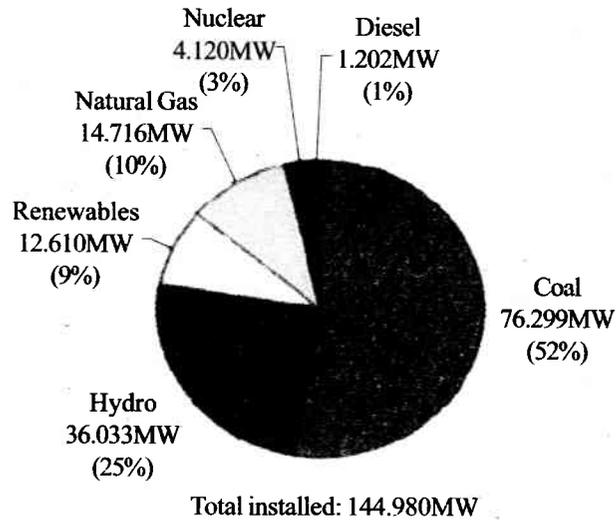
data source: Bloomberg New Energy Finance, UNEP SEI, Frankfurt School, Global Trends in Renewable Energy Investments 2011



- B5. (a) Analyse the graph and briefly explain on investment in renewable energy. (4 marks)  
(b) Name any two first and second generation biofuel. (2 marks)  
(c) How can you make use of renewable source of energy at your home? (4 marks)

### Module VI

#### Energy consumption in India per year



- B6. (a) Analyse the pie chart, prepare a report on energy consumption in India per year. (3 marks)  
(b) The major energy used in India is conventional energy which cause environmental pollution. List out any four methods to prevent pollution. (4 marks)  
(c) List out any three results of pollution prevention. (3 marks)