

UNIVERSITY OF RUHUNA
FACULTY OF AGRICULTURE
Second Examination in BSc in Green Technology (Part II)

September 2023

EN12202- Environmental Footprints (Compulsory)

Theory – MCQ Type

INSTRUCTIONS

TIME: 30 Minutes

Index Number

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Answer ALL questions.

Mark your answers by placing “√” against the selected alternative among the five alternatives.

Only non-programmable calculators are permitted.

Mobile phones are not permitted.

1. Select the correct answer based on the following statements.
 - A. Demands for natural resources such as food, medicine, shelter, energy, etc. are being increased due to the expansion of the world population.
 - B. Waste generation from agriculture, industries, mining, services, etc. imposes threats to the environment.
 - C. Frequent floods, droughts, and spreading of diseases are not basically occurred due to the over utilization of natural resources.
 - i. All statements are correct.
 - ii. All statements are incorrect.
 - iii. Only statement “A” is correct.
 - iv. Only statements “A” and “B” are correct.
 - v. Only statements “B” and “C” are correct.

2. The ability of ecosystems to produce useful biological materials and to absorb wastes generated by humans, using current management and extraction technologies are known as;
 - i. Ecological Footprint
 - ii. Carrying Capacity
 - iii. Biocapacity
 - iv. Overshoot
 - v. Environmental Footprint

3. Select correct answer based on the given statements.
 - A. Meeting our own needs without compromising the ability of future generations to meet their own needs is considered as sustainability.
 - B. Environmental sustainability is the ability to maintain an ecological balance in our planet’s natural environment and conserve natural resources to support the wellbeing of current and future generations.
 - C. Environmental sustainability is enhanced by the overuse of natural resources like water, fuel, forest, wildlife, etc.
 - i. All statements are correct.
 - ii. All statements are incorrect.
 - iii. Only statement “A” is correct.
 - iv. Only statements “A” and “B” are correct.
 - v. Only statements “B” and “C” are correct.

4. Select the correct statement.
- i. Ozone depletion potential, Global warming potential, Acidification potential cannot be used for the identification of potential environmental impacts.
 - ii. Eutrophication potential increase by agricultural and industrial discharges containing heavy metals.
 - iii. Ecoefficiency is an indicator that can be used for the evaluation of environmental sustainability based on the concept of creating more goods and services while using fewer resources and creating less waste and pollution.
 - iv. Ecological footprint is the only indicator that can be used for the evaluation of environmental sustainability of product processes and services.
 - v. Water footprint does not belong to the group of environmental footprints.
5. are indicators of human pressure on the environment.
- i. Environmental footprints
 - ii. Ecological footprints
 - iii. Water footprints
 - iv. Carbon footprints
 - v. Nitrogen footprints.
6. Select the correct answer based on the following statements with respect to the environmental footprints.
- A. The large environmental footprints indicate the less resources used for the supporting of human lifestyle.
 - B. Quantitative measures showing the appropriation of natural resources used by humans for the day today activities.
 - C. Describes how human activities can impose different burdens and impacts on the global environment.
- i. All statements are correct.
 - ii. All statements are incorrect.
 - iii. Only statement "A" is correct.
 - iv. Only statements "A" and "B" are correct.
 - v. Only statements "B" and "C" are correct.
7. Select the correct answer.
- i. The concept of "footprint" originates for the idea of "Carbon Footprint" conceived in 1990 by Mathis Wackernagel and William Rees at the University of British Columbia.
 - ii. Environmental footprint indicates particular classes of pressures associated with process, product, or activity from the life cycle perspective.
 - iii. Ecological footprint does not count the impact imposed on the environment by the discharge of pollutants from the different human involvements.
 - iv. Environmental footprints measure either resource use or emissions only, not both.
 - v. Ecological footprints can be calculated only for a region or country, not for a person or groups of persons.

8. Global hectare is used for the measurement of
- Environmental footprint and Ecological footprint
 - Ecological footprint and biocapacity
 - Biocapacity and carbon footprint
 - Carbon footprint and water footprint
 - Ecological footprint and carbon footprint
9. Select the incorrect statement with respect to the yield factor.
- It allows different areas of the same land type to be compared based on the yield.
 - National yield factor for paddy compare the productivity of average paddy production in a specific nation to the world-highest paddy production.
 - Yield factors convert one hectare of a specific land type within a given nation into an equivalent number of world-average hectares of that same land type.
 - The national yield factor for a given land type is calculated as the ratio of national average yields of that land type and world-average yields of that land type.
 - Yield factors are calculated for each land type in each nation in each year.

Yield factors for selected countries in the year 2007 given in the table. Use the table to answer the following two questions (10-11).

10. The country that has the highest crop productivity is,

- Hungary
- Germany
- Zambia
- Japan
- New Zealand

Yield	Cropland	Forest	Grazing Land	Fishing Grounds
World Average	1.0	1.0	1.0	1.0
Algeria	0.3	0.4	0.7	0.9
Germany	2.2	4.1	2.2	3.0
Hungary	1.1	2.6	1.9	0.0
Japan	1.3	1.4	2.2	0.8
Jordan	1.1	1.5	0.4	0.7
New Zealand	0.7	2.0	2.5	1.0
Zambia	0.2	0.2	1.5	0.0

11. More carbon sequestration per hectare can be expected from
- New Zealand
 - Japan
 - Germany
 - Zambia
 - Algeria

12. Select the correct statement with respect to the equivalent factor.
- It is the key factor that allows different land types to be converted into the common unit of hectares.
 - Equivalence factor is calculated comparing the relative productivity of a particular land with the productivity of different land types in any given year.
 - Forest land has the highest equivalent factor.
 - The lowest equivalent factor goes to crop lands.
 - The forest and grasslands have similar equivalent factors.

13. Select the correct answer.

- i. If the ecological footprint of a country is less than its biocapacity, the resource consumption is unsustainable.
- ii. When the calculation of ecological footprint of country, the import and export of goods and services should also be considered.
- iii. A very less contribution given by the carbon footprint of ecological footprint.
- iv. The biocapacity is higher than ecological footprint in the world at present.
- v. Ecological footprint is higher in low-income countries than in high income countries.

14. components of water are considered in water footprint calculations.

- i. Green and blue
- ii. Blue and grey
- iii. Grey and green
- iv. Blue, green, and grey
- v. Irrigation and rain

15. Select the correct answer.

- i. Virtual water is water used for the direct use of water in the production process.
- ii. The highest virtual water content can be observed in crop products.
- iii. The less consumption of meat is more environmentally friendly with respect to the water footprint.
- iv. The water footprint is always given by liters per kilogram.
- v. In the calculation of national water footprints, water embodied in export and import goods are not considered.

16. Select the correct answer based on the following statements.

- A. The grey WFP is the volume of polluted water, which is quantified as the volume of water that is required to dilute pollutants to such an extent that the quality of the ambient water remains above agreed water quality standards.
 - B. The green WFP is the volume of water evaporated from the ground water resources.
 - C. The blue WFP is the volume of freshwater that evaporates from the rainwater stored in the soil.
- i. All statements are correct.
 - ii. All statements are incorrect.
 - iii. Only statement "A" is correct.
 - iv. Only statements "A" and "B" are correct.
 - v. Only statements "B" and "C" are correct.

17. Select the incorrect statements regarding Global warming potential (GWP).

- i. It indicated each gas relative to that of CO₂.
- ii. It considers a fixed time period, such as 100 years.
- iii. It shows the relative effect of GHG in terms of climate change.
- iv. High emissions of gases with a low GWP can have a considerable impact.
- v. GWP expresses the relative increase in earthward IR radiation flux due to the emission of organic compounds.

18. One person travels 200 km by diesel car. The fuel efficiency of this car is 15 km/l. Find the CFP of this travelling activity (Emission factor of diesel is 2.7 kg CO₂e/l).
- 80 kg CO₂e
 - 70 kg CO₂e
 - 60 kg CO₂e
 - 50 kg CO₂e
 - None of above
19. PAS 2050 was introduced in 2008 (revised in 2011) with the aim of providing a consistent internationally applicable method for quantifying.
- Event carbon footprints
 - Product carbon footprints.
 - Individual carbon footprints
 - Organizational carbon footprints.
 - All of above
20. The recommended approach for calculating the uncertainty of carbon footprint model is to perform a
- Regression analysis
 - Monte Carlo analysis
 - Analysis of variance
 - All of above
 - None of above
21. Which of the following activity/ies are included in to **scope 2** in calculating organizational carbon footprint?
- Fugitive emissions
 - Purchased electricity.
 - Employee business travel
 - Employees commuting to and from work.
 - Generation of electricity, heat, or steam with in the company
- A only
 - B only
 - A and E only
 - B and D only
 - C and D only
22. Who is the largest producer of territorial fossil fuel CO₂ emissions worldwide in 2021, based on their share of global CO₂ emissions?
- UK
 - USA
 - China
 - Brazil
 - Australia

23. Which of the following should not include into the boundary of product carbon footprint calculations?
- i. Human inputs to processes
 - ii. Animals providing transport Carbon
 - iii. Transport of consumers to retail outlets
 - iv. Immaterial emissions sources less than 1% of total footprint
 - v. All of above
24. Which of the following sentences is/are **correct** regarding the defining the boundaries for calculating organizational carbon footprint?
- A If the reporting company wholly owns all its operations, its organizational boundary may differ depending on the approach used.
 - B For companies with joint operations, the organizational boundary will be the same whichever approach is used.
 - C Equity share reflects the percentage of economic interest which is the extent of rights a company has to the risks and rewards flowing from an operation.
- i. A only
 - ii. B only
 - iii. C only
 - iv. A and B only
 - v. B and C only
25. What do you mean by “Tiers” in IPCC Guidelines for National Greenhouse Gas Inventories (2006 Guidelines)
- i. Tiers use to develop the process map.
 - ii. Tiers can directly measure carbon footprint.
 - iii. Tiers represents a level of methodological complexity.
 - iv. Tiers 1,2,3 included in to scope 1,2,3 respectively.
 - v. None of above

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