



# UNIVERSITY OF RUHUNA

## Faculty of Engineering

End-Semester 1 Examination in Engineering: October-2022

Module Number: CE1101 Module Name: Basic Concepts in Environmental Engineering

### SECTION – A

[One Hour]

[Answer all questions in the Exam Paper itself. 20 MCQs + 10 fill-in-the-blanks = 30 Questions]

Index Number: .....

Read all the instructions carefully (20 MCQs):

- **Select the BEST answer** for the questions 1 to 20.
- Each question carries **1.0 Mark**.
- Please note that wrong answer will result in **NEGATIVE** marks (- 0.25 Marks for each wrong answer) for only the **MCQ questions 1 to 20**.
- Negative marks of this section will **NOT** be carried forward to other sections.
- Questions not attempted will result in zero mark.
- **Total Marks= 20**

- 1) Which of these is NOT correct on global warming?
  - a) Greenhouse gas enhances absorbing and re-emitting infrared radiation toward the earth.
  - b) Global warming can also increase the vector bone diseases
  - c) Global warming will increase the urbanization rate
  - d) Global warming effects can be seen in the atmosphere, hydrosphere, lithosphere, and biosphere
- 2) What can be the order of the following water sources based on their electrical conductivity?
  - i) Upstream of a River
  - ii) Lagoon Water
  - iii) Deep Groundwater
  - a) i) > iii) > ii)
  - b) iii) > ii) > i)
  - c) ii) > iii) > i)
  - d) ii) > i) > iii)

- 3) The Sri Lankan Standard (SLS) for Turbidity in drinking water is less than ....., while that of WHO guidelines is less than 5.0 NTU.
- 1.0 NTU
  - 2.0 NTU
  - 7.0 NTU
  - 10 NTU
- 4) If the air quality index (AQI-USEPA) value of a city on a given day is 45, which one of the following gases will be the **correct statement**,
- Sensitive groups must avoid outdoor activities.
  - Elderly people must avoid being outdoors.
  - Everyone can enjoy outdoor activities.
  - Everyone should avoid outdoor activities.
- 5) Which of the following gases are **NOT** included in the category 'greenhouse gases'?
- (i) Ozone      (ii) Argon      (iii) Hydrogen      (iv) Nitrous oxide
- i) and ii) Only
  - i) and iii) Only
  - ii) and iii) Only
  - ii) and iv) Only
- 6) Which of the following statements is true?
- Environmental impact assessment is necessary only when the project is located in a sensitive area.
  - If significant environmental impacts are unlikely to occur, project proponent can decide to go for an IEE.
  - If significant environmental impacts are unlikely to occur, the project approving agency can decide to go for an IEE.
  - If significant environmental impacts are unlikely to occur, project proponent can decide to go for an IEE.
- 7) Waste generation rate is essential to predict future waste generation and to evaluate the waste generation trends. What can be the average waste generation rate in a "Pradeshiya Sabha" area in rural Sri Lanka?
- 0.3 m<sup>3</sup>/capita / day
  - 0.3 kg/capita / day
  - 1.0 kg/capita / day
  - 1.0 m<sup>3</sup>/capita / day
- 8) Which one(s) of the followings is (are) considered as 'Green' power source?
- (i) Biomass      (ii) Bio gas      (iii) Natural gas.      iv) Solid waste
- (ii) Only
  - (i) and (ii) Only
  - (i), (ii) and (iii) Only
  - (ii) and (iv) Only

- 9) What is the approximate per capita daily water demand in Sri Lanka??
- 120 m<sup>3</sup>
  - 12 m<sup>3</sup>
  - 120 L
  - 1200 L
- 10) A 350 mL aqueous solution has 3.5mg of salt dissolved in it. Express the concentration of salt in this solution in terms of ppb.
- 10
  - 10,000
  - 1,000
  - 100
- 11) It is found that 41 mg of NaCl has been dissolved in a 120 mL water sample. What will be the NaCl "concentration" in percentage?
- 0.0034 %
  - 0.034 %
  - 3.4 %
  - 34 %
- 12) Watch of the following metals are considered as Toxic Metal pollutants in water considering the human health?
- (i) Arsenic.      (ii) Sodium      (iii) Potassium      (iv) Lead
- (i) and (iii) only
  - (i) and (iv) only
  - (i) , (iii) and (iv) only
  - (i) only
- 13) What are the factors that affect DO concentration in water?
- (i) Turbidity      (ii) Cloud level      (iii) Temperature      (iv) Pressure
- (i) and (iii) only
  - (iii) and (iv) only
  - (i) , (iii) and (iv) only
  - All above
- 14) What is the approximate per capita freshwater availability in Sri Lanka?
- 2500 L/year
  - 2500 m<sup>3</sup>/year
  - 25000 m<sup>3</sup>/year
  - 25000 L/year

- 15) Countries are requested limiting the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5 °C. This decision was taken at the,
- Kyoto Conference
  - COP-26 Conference
  - Paris Conference
  - Stockholm Conference
- 16) Which one of the following is correct on "Solid Waste?"
- Average countrywide solid waste data can be used in a specific city context
  - Low economic standing is directly related to an increase in solid waste volume
  - Rural villages and small towns have significantly higher values of generated waste per capita
  - Average lifespan of many consumer products is increasingly reduced
- 17) The journey of water, from being collected in forested catchments to returning to the natural water cycle as purified wastewater, is called as;
- Urban water cycle
  - Water treatment
  - Natural hydrological cycle
  - Hydrological movement
- 18) Which one of the following is **NOT** correct on "Turbidity" in a lake?
- High turbidity may decrease the DO level
  - High turbidity can clog the fish gills
  - High turbidity may reduce the photosynthesis process
  - High turbidity may reduce the water temperature
- 19) Which one of the following is the standard unit of Hardness in water?
- mg/L
  - mg/L as Ca
  - mg/L as CaCO<sub>3</sub>
  - mg/L as Mg
- 20) It was found that the suspended solid concentration of a 1000 mL water sample is 56 mg/L. What will be the "dissolved solid concentration" of this sample if the total solid concentration is 256 mg/L.
- 0.2 mg/L
  - 200 mg/L
  - 312 mg/L
  - 0.312 mg/L

Read all the instructions carefully (10 fill-in-the blank questions):

- Fill in the blanks with the most appropriate word/s for questions 21 to 29.
- Each filled blank carries 1 Mark
- Questions not attempted will result in zero mark.
- Total Marks= 10

- 21) Not only income but also ..... of a city indicated by its population size is interrelated with the waste generation rates
- 22) The incomplete combustion of fossil fuels can generate .....
- 23) ..... measures the amount of water used to produce each of the goods and services we use
- 24) ..... of water is affected by the presence of dissolved ions in the water, including salts and heavy metals
- 25) Carbonate hardness is also called ..... which is caused by the presence of carbonates, and bicarbonates of calcium and magnesium
- 26) ..... is the most common nontoxic metal in water sources and highly reactive to other elements
- 27) ..... is simply the increase in concentration of a substance in a food chain
- 28) Environmental Impact A process starts when the project proponent submits the project proposal to .....
- 29) Air quality index calculated according to US EPA method ranges from ..... and when AQI increases 300, the air quality at that location is .....