

Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
Department of Science and Technology
200 level 1st Semester Examination – Sept./Oct. 2015
BGE 231-3 Biology, Chemistry and Environmental Science



Instructions to candidates

Duration: 03 hours

Number of questions: **Six (6) Essay questions**

Answer all questions

Mark allocation: 100

Paper consists of two parts, **Part A and Part B**

Part- A

1.
 - a. Name the three key components of biodiversity (5 mark)
 - b. Biological diversity has important economic, technological and social implications for the nation. Briefly discuss the implications in valuing the biodiversity resources of a nation (10 mark)

2.
 - a. How does human intervention exacerbate species extinction? (8 mark)
 - b. Discuss the significance of Environmental Impact Assessments. (5 mark)
 - c. Describe three (3) challenges faced in dealing with the conservation of biological resources (7 mark)

3.
 - a. Explain how atmospheric warming might affect each of the following
 - i. food production
 - ii. sea levels
 - iii. human health (6 mark)
 - b. Briefly discuss the following
 - i. Waste is a potential resource
 - ii. Poverty and environmental degradation
 - iii. Ozone depletion (9 mark)

Part- B

1. Strong Acids give protons (H⁺) when dissolved in water and strong bases give hydroxyl ions (OH⁻) in water.

a. Classify following as acids or bases. (3 mark)

HCl, H₂SO₄, Mg(OH)₂, Ca(OH)₂, H₃PO₄, NH₄OH

b. Write the name of above acids or bases (3 mark)

c. Write the balance chemical reaction when HCl is reacted with Mg(OH)₂ giving magnesium chloride and water as products (5 mark)

d. If 0.5 mole of HCl is reacted with Mg(OH)₂, how many moles of magnesium chloride is produced? (4 mark)

2. Read the paragraph below and answer to questions.

Polystyrene is a synthetic aromatic polymer made from the monomer styrene. Polystyrene can be solid or foamed. General purpose polystyrene is clear, hard, and rather brittle. It is an inexpensive resin per unit weight. It is a rather poor barrier to oxygen and water vapor and has a relatively low melting point. Polystyrene is one of the most widely used plastics, the scale of its production being several billion kilograms per year. As a thermoplastic polymer, polystyrene is in a solid (glassy) state at room temperature but flows if heated above 100 °C, its glass transition temperature. It becomes rigid again when cooled. This temperature behavior is exploited for extrusion, and also formolding and vacuum forming, since it can be cast into molds with fine detail. Polystyrene is very slow to biodegrade and is therefore a focus of controversy. It is often abundant as a form of litter in the outdoor environment, particularly along shores and waterways, especially in its foam form.

a. List one Physical property and one chemical property of polystyrene. (2 mark)

b. What is thermoplastic behavior? (2 mark)

c. Give the meaning of following terms

i. Aromatic Polymer

ii. Monomer

iii. Biodegrade (6 mark)

d. Give two methods of making polystyrene foam. (2 mark)

e. Draw the structure of monomer unit of polystyrene and polymer of polystyrene (4 mark)

f. Why polystyrene is considered as a pollutant in outdoor environment? (4 mark)

- 3.
- a. What is the difference between a rock and a mineral? (4 mark)
 - b. Silicate minerals differ from each other based on arrangement of SiO_4 units. Give three examples of silicate based minerals and how these are different in structure from each other. (3 mark)
 - c. Ilmenite is a mineral found in Sri Lanka with high commercial value.
 - i. Where do you find the highest ilmenite deposit in Sri Lanka?
 - ii. Why ilmenite cannot be used directly without purification?
 - iii. List two uses of this mineral (8 mark)

