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Uva Wellassa University of Sri Lanka
Faculty of Science and Technology
2nd Year 1st Semester Examination- August/September 2014

Uva Wellassa University

BGE 231 – 3 Biology, Chemistry and Environmental Science

No. of pages : 03
Time allocation : 03 hours
Marks allocation : 110
Answer both parts A and B

PART –A
Answer ALL Questions. (50 marks)

1. a. Explain the link between poverty and environmental degradation. (5 Marks)

   b. What are the environmental health effects that could be caused by global warming? (5 Marks)

2. Many different kinds of human activities to reduce biodiversity around the world. Identify those three with the greatest impact, and describe why you feel these are more significant than the rest. (20 Marks)

3. a. What is the difference between a National Park and a Sanctuary? (5 Marks)
   b. "Our National Parks are beset by numerous problems such as visitors related problems, lack of adequate funds for the management and some issues are caused by human activities outside parks". Elaborate and discuss the statement. (5 Marks)

4. Briefly discuss the followings.

   a. EIA systems in Sri Lanka
   b. Convention on International Trade in Endangered Species (CITES)
   c. Waste is a potential resource
   d. Invasive species in Sri Lanka

   (10 Marks)

35

PART-B

Answer any three (3) Questions. (60 marks)

1. Read the following paragraph about iron extraction and answer the questions.

Three substances are needed to enable to extraction of iron from its ore. The combined mixture is called the charge which consists of hematite (iron oxide mixed with sand), limestone (calcium carbonate), and coke (which is only carbon). The charge is placed a in giant chimney called a **blast furnace.** The blast furnace is around 30 m high and lined with fireproof bricks. Hot air is blasted through the bottom. Coke and limestone are used to produce carbon monoxide gas, which is used to reduce iron oxide to iron metal. Iron has melting point about 1500 ^{0}C.The iron whilst molten is poured into molds and left to solidify. This is called cast iron and is used to make railings and storage tanks. The rest of the iron is used to make steel which is a homogeneous mixture of iron and carbon. As waste, calcium silicate (slag) is produced when calcium oxide from limestone reacts with sand.

a. Give **two** examples for following from the above paragraph
(i) homogeneous mixtures (ii) compounds (iii) elements (iv) physical properties

b. Draw a block diagram to illustrate the steps involved in iron extraction.

c. Balance following reactions involved in iron extraction

$$Fe_2O_3 + CO \rightarrow Fe + CO_2$$

d. Calculate how many moles of Fe is produced if 15 moles of CO is used?
(Atomic Weights Fe =56, C= 12, O=16)

(20 Marks)

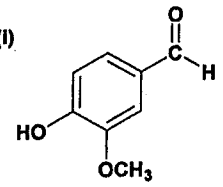
2. a. State whether following are acidic or basic and identify which chemical is responsible for acidic or basic nature of following household items (i) vinegar (ii) detergents (iii) lime
b. Balance following reaction involved in neutralizing stomach acid by milk of magnesia

$$Mg(OH)_2 + HCl \rightarrow MgCl_2 + H_2O$$

c. (i) Calculate the formula weight of $Mg(OH)_2$. The regular dosage of milk of magnesia contains 1200mg of $Mg(OH)_2$.
(ii) Calculate how many moles of $Mg(OH)_2$ present in this dose. (Atomic weights of Mg=24 H=1, O=16)
d. What is acid rain? What factors cause acid rain? (20 Marks)

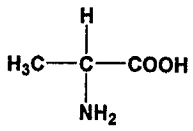
3. a. Identify functional groups present in following molecules.

(I)



Vanillin

(II)



Alanine

b. List four properties of organic molecules which are different from ionic compounds.

c. Draw the structure of following hydrocarbons. (i) C_2H_6 (ii) C_6H_6 (iii) C_4H_6

d. Discuss with examples how applications of hydrocarbons vary with increasing number of carbon atoms.

(20 Marks)

4. a. List two examples of food items for following (i) Carbohydrates (ii) Proteins (iii) Lipids

b. Identify the smallest building unit for following (eg. for carbohydrates, smallest building unit is monosaccharides) (i) proteins (ii) Lipds

c. A person with calorie intake of 2870 cal/day would like to loose 5 lb in one month. Calculate his new calorie intake in order to achieve this target. (for every 3500 cal energy output, body looses 1 lb of body fat)

d. Explain briefly why it is not recommended to drink tea immediately after a heavy meal.

(20 Marks)