



**RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES**

**B.Sc. (General) Degree in Applied Sciences
Third year Semester I Examination – November / December 2016**

CHE 3201 –Industrial Inorganic Materials

Time: Two (2) hours.

Answer any **four** questions.

1. a) Briefly explain the following types of glass:
(i) Toughened glass.
(ii) Laminated glass.
(iii) Coated glass. (30 marks)
- b) Describe the following terms used in glass industry:
(i) Formers.
(ii) Fluxes.
(iii) Stabilizers. (24 marks)
- c) Discuss briefly the following types of graphite and name two locations where graphite is available in Sri Lanka.
(i) Flake graphite.
(ii) Vein graphite
(iii) Amorphous graphite. (30 marks)
- d) Identify three pollutants one each from glass industry, ceramics industry and cement industry. Describe any one of the pollutants you have identified the above industries. (16 marks)

- 2). a) Explain the manufacturing steps of ceramics. (40 marks)
- b) Why are kaolinite and bentonite used for manufacturing ceramics? What is meant by glazing? Give the components along with their effects of glaze. (40 marks)
- c) List five industrial application of ceramics and name five commonly used articles made of porcelain and other ceramics. (20 marks)
- 3). a) Write down the main raw materials along with their sources used in cement industry. (20 marks)
- b) List the basic composition of Portland cement and give the compound mixture form when mixing. (20 marks)
- c) Explain briefly the five stages in manufacturing of Portland cement by wet process. Discuss the different temperature zones along with their processes in rotary kiln. (40 marks)
- d) Write short notes on health hazards inherent to cement production process. (20 marks)
- 4). a) What do you mean the following terms used in classifications of transparency in cut gemstones and name one variety of gem to suit for each term:
 (i) Opaque.
 (ii) Translucent.
 (iii) Transparent. (24 marks)
- b) State and explain briefly two categories of gems with regard to the source of their colour. (24 marks)
- c) Write short notes on the following basic behaviors of light which useful in describing gemstones:
 (i) Dispersion.
 (ii) Pleochroism. (22 marks)

- d) Compare the two processes for producing titanium dioxide from ilmenite and rutile and give three uses of titanium dioxide. (30 marks)
- 5). a) Briefly describe the following types of fertilizers: (21 marks)
- (i) Straight fertilizers.
 - (ii) Complex fertilizers.
 - (iii) Mixed fertilizers.
- b) Explain the steps involved in the production of ammonia. Suggest a procedure to estimate the percentage of nitrogen present in urea. (40 marks)
- c) Write down the balanced chemical equations in the production of SSP and TSP from phosphate rock. (20 marks)
- d) Discuss the use of organic fertilizers in agriculture. Compare the advantages and disadvantages between organic fertilizers and inorganic fertilizers. (19 marks)

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