



RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. Third year Semester I Examination – June / July 2018

CHE 3201 –Industrial Inorganic Materials

Answer any four questions.

Time: 2 hours.

1). (a) Give the composition and two uses of following types of glasses.

- (i) Soda glass.
- (ii) Flint glass.
- (iii) Potash glass.
- (iv) Pyrex glass.
- (v) Crown glass.

(40 marks)

(b) Discuss the properties and limitations of lead glass and borosilicate glass. List two uses of each type.

(30 marks)

(c) Briefly discuss the three basic types of ingredients, formers, fluxes, and stabilizers involve in making glasses.

(30 marks)

2). (a) Discuss the structure of graphite and its applications.

(25 marks)

(b) What is the use of fluxing and refractory agents used in ceramic production and name three fluxing agents and three refractory agents commonly used in ceramic industry?

(20 marks)

(c) Briefly discuss the steps involving in the manufacturing process of ceramics glazing and enamels.

(30 marks)

(d) Account different types of pollutants generated during the manufacturing process of ceramics.

(25

marks)

- 3). (a) List five main compounds necessary for Portland cement manufacture and identify at least one source of them. (30 marks)
- (b) State five points to control environmental protection in the cement industry, and discuss briefly one of them. (25 marks)
- (c) Estimate the percent lime saturation factor, silica ratio and alumina ratio for following two types of porcelain cement and discuss the quality of cement based on your answers.

Oxides	Percent content	
	Type I	Type II
CaO	60	42
SiO ₂	17	25
Al ₂ O ₃	3.0	8.0
Fe ₂ O ₃	0.5	6.0

(45 marks)

- 4). (a) What are the three major types of inclusions in gemstones? Provide details. (30 marks)
- (b) What is gemstone treatment? Briefly discuss at least five types of treatments and name two varieties of gem under each treatment. (45 marks)
- (c) Write short notes on the minerals available at north east coast of Sri Lanka and give the flow chart to extract TiO₂ from it. (25 marks)

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- 5). (a) What are the environmental effects of nitrogen fertilizers?
(25 marks)
- (b) What does nitrogen do to a plant?
(20 marks)
- (c) (i) Discuss briefly the type of organic fertilizers.
(ii) Organic fertilizers are more environmentally friendly than traditional chemical fertilizers. Explain.
(35 marks)
- (d) Give the steps involved in the production of urea. Name two uses of urea.
(20 marks)

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