
UNIVERSITI SAINS MALAYSIA

KSCP Examination
Academic Session 2010/2011

June 2011

EBB 523/3 - Ceramic Processing

Duration : 3 hours

Please ensure that this examination paper contains THREE printed pages before you begin the examination.

This paper contains SIX questions.

Instruction: Answer **FIVE** questions. If candidate answers more than five questions only the first five questions answered in the answer script would be examined.

The answers to all questions must start on a new page.

All questions must be answered in English.

1. [a] Outline 4 ceramic processing methods.

(20 marks)

 [b] Name 4 important powder characteristics for advanced ceramics.

(20 marks)

 [c] Describe three particle fracture mechanisms.

(60 marks)

2. [a] Illustrate hot isostatic press.

(40 marks)

 [b] Elaborate on gel casting.

(60 marks)

3. [a] Differentiate ceramic, glass and glass ceramic in term of their process.

(30 marks)

 [b] Among various techniques in ceramic industry, injection molding is given the last priority as ceramic production technique. Discuss it.

(70 marks)

4. Briefly describe the following ceramic materials processing techniques:-
 - (i) Tape casting technique
 - (ii) Ceramic Foam Manufacturing
 - (iii) Extrusion of ceramic product

(100 marks)

5. [a] Explain briefly what are the important factors need to be considered if you are a manufacturer dealing with ceramic tool that need a metal joining?
(50 marks)
- [b] Explain briefly on Polymer derived ceramic (PDC) and state 4 type of PDC?
(25 marks)
- [c] Draw a flow chart illustrating the synthesis of SiC by PDC method.
(25 marks)
6. [a] Sintering is an essential process in ceramic processing field. Explain in details what happen during sintering process of a green body. Secondly, state whether grain growth is beneficial for sintering? Discuss.
(50 marks)
- [b] Explain briefly on the synthesis of ceramic composite by self-propagation high-temperature synthesis (SHS) method. Cite 2 materials which are worth to be produce by SHS as compared to conventional solid state sintering method.
(50 marks)