



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(CT)/SEM-5/CT-506/2011-12

2011

CERAMIC COATING

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

10 × 1 = 10

i) Which oxide is always present in enamel glass ?

- | | |
|-----------------------------------|----------------------------------|
| a) CuO | b) Cu ₂ O |
| c) Sb ₂ O ₃ | d) B ₂ O ₃ |

ii) Number of oxides present in sheet glass almost is/are

- | | |
|----------|-------------------|
| a) 1-2 | b) 5-6 |
| c) 16-17 | d) none of these. |

iii) Which one of the below mentioned is not fluxing agent ?

- | | |
|-------------|---------------------|
| a) Borax | b) CaF ₂ |
| c) Cryolite | d) NbO ₂ |



iv) Surface Engineering is a design of composite system that is

- a) Ground coat and cover coat
- b) Substrate and coating
- c) Interface and coating
- d) Substrate and interface.

v) In pickling process which of the following is not used ?

- a) HCl
- b) H_3PO_4
- c) H_2SO_4
- d) NH_4Cl .

vi) Inhibitors are added to the solution of mineral acid

- a) (0.1 – 0.2) %
- b) (1 – 2) %
- c) (3 – 4) %
- d) (5 – 6) %.

vii) Sand blasting or metal shot blasting is done at a temperature around

- a) 2000°C
- b) 4000°C
- c) 8000°C
- d) room temperature.

viii) A thinner coating improves thermal shock resistance.

- a) True
- b) False.



ix) Convex substrate surfaces need better matching with coating than concave substrate surfaces.

a) True b) False.

x) Substitution of Na₂O by B₂O₃ in coating increases thermal expansion coefficient.

a) True b) False.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What are the purposes of vitreous coating ? State some uses of vitreous coating. $2 + 3$
3. Write in short about Degreasing process.
4. What is inhibitor and what are the uses of it ? State some advantages and disadvantages of using inhibitors. $2 + 3$
5. What is Sand Blasting ? State pre treatment line/sequence for aluminium hollow ware enameling. $2 + 3$
6. State some advantages and disadvantages of Sputtering.

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. State differences between vitreous coating and glass ceramic coating. State the sources and important properties imparted in vitreous coating composition by PbO. What is neutralization process ? What are the uses of electrolytes in enamel preparation ? Describe the causes and remedies for the defect - fish scaling. $3 + 3 + 2 + 2 + 5$



8. What are the purposes of Ground Coat and Cover Coat ?
Name two oxides present in ground coat. State some opacifiers used in enamel preparation. Opacifiers are added in enamel in two ways. What are they ? Explain. What is degree of opacification ? What are the factors controlling the opacification ?
3 + 1 + 1 + 5 + 1 + 4
9. What is Chemical Vapour Deposition ? What is Physical Vapour Deposition ? State Pickling process in brief. What are the properties to be controlled before steel enamelling ?
3 + 3 + 6 + 3
10. Write short notes on any *five* of the following : 5 × 3
- a) Causes and remedies of defect orange peeling.
 - b) Ni-deposition
 - c) Preparation of metal (steel) surface for enamelling
 - d) Pretreatment line/sequence for copper ware enamelling
 - e) Mechanism of inhibitors
 - f) Objective of fritting
 - g) Justification of essentiality of oxidising atmosphere for enamelling reaction.

