



MBU-003-1104003 Seat No. _____

M. Sc. (Sem. IV) (CBCS) Examination

March / April - 2018

Physical Chemistry : C(PM)-403

(Chemistry of Materials-I)

(New Course)

Faculty Code : 003

Subject Code : 1104003

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (1) All questions are compulsory.
- (2) All questions carry equal marks.
- (3) Each question carries 14 marks.

1 Answer the following : (any **seven**)

- (a) Define : Solar energy, Fuel cell, Nano material, Micelles.
- (b) Discuss methyl alcohol fuel cells.
- (c) State the factors affecting ultra sonic waves.
- (d) What are the advantages of solar energy ?
- (e) What are the different physico chemical properties required for QSAR ?
- (f) Define surfactant, what are the different components of a typical surfactant describe with the structure ?
- (g) What are the importances of nano technology ?
- (h) Discuss advantages of photovoltaics.
- (i) Give an account of Gemini surfactant.

2 Answer the following : (any **three**)

- (a) Discuss Solar technology.
- (b) Explain hydrogen-oxygen fuel cell.
- (c) Which type of acoustical properties can be calculated by ultrasonics ?
- (d) Discuss carbon nano tubes.

3 Answer the following :

- (a) What are the requirements of fuel cell ?
- (b) Explain the applications of photovoltaic system.

OR

- (a) Discuss the micellar structure and shape. What are the factors affecting size, shape and aggregation number of micelle ?
- (b) Give the applications of nano materials.

4 Answer the following : (any **three**)

- (a) What is the principle of ultrasonics ? Give its applications.
- (b) Give brief account of photocell that trap solar energy.
- (c) Give the full form of QSAR. Explain Hammett substitution constant.
- (d) Give the coprecipitation method for the synthesis of nano materials with suitable examples.

5 Answer the following : (any **two**)

- (a) Discuss the general chemistry of fuel cell.
- (b) What is critical micelle concentration ? Discuss the factors affecting critical micelle contraction.
- (c) (i) What are the advantages and disadvantages of micro emulsion ?
(ii) Explain the various properties of micro emulsion.
- (d) Explain :
 - (i) Environmental implications of solar energy.
 - (ii) Discuss taft-steric factors.