Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

## Question Paper Code : 30901

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

First Semester

Civil Engineering

CY 2111 — ENGINEERING CHEMISTRY – I

(Common to all Branches)

(Regulation 2008)

Time : Three hours                                                  Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why do we express hardness of water in terms of $CaCO_3$ equivalents?

2. Write the principle of break point chlorination.

3. What is copolymerisation? Give an example.

4. How is Teflon prepared? Mention its uses.

5. What is an isotherm? What are its types?

6. What is an adsorbent?

7. Distinguish between nuclear fission and nuclear fusion.

8. How Ni-Cd battery is constructed?

9. What are refractories? How are they classified?

10. What are solid lubricants? Give one example.

PART B — (5 × 16 = 80 marks)

11.  (a)  (i)  Define hardness. How is it determined?  (10)

        (ii)  Give a brief note on the disadvantages of using hard water in boilers.  (6)

Or

     (b)  (i)  What is internal conditioning? What are the various methods of internal conditioning? Explain.  (10)

        (ii)  Write a note on demineralization process.  (6)

12.  (a)  (i)  Write the mechanism of free radical polymerization. What are the monomers which can be polymerized by free radical polymerization?  (10)

        (ii)  Write the differences between thermoplastic and thermosetting plastics.  (6)

Or

     (b)  (i)  Write the preparation and uses of the following polymers.

            (1)  Polycarbonate

            (2)  Teflon.  (8)

        (ii)  How are polymer matrix composites and fibre reinforced plastics made?  (8)

13.  (a)  (i)  Derive Langmuir's adsorption isotherm.  (8)

        (ii)  What are the factors affecting rate of adsorption?  (8)

Or

     (b)  (i)  What are the differences between physisorption and chemisorption?  (8)

        (ii)  Derive Gibbs adsorption equation.  (8)

14.  (a)  (i)  Describe the principle behind the functioning of solar cell.  (8)

        (ii)  Explain the construction of lead-acid battery. Write the discharging and charging reactions.  (8)

Or

     (b)  (i)  Describe the construction and working of $H_2 - O_2$ fuel cell. What are its applications?  (8)

        (ii)  Describe the functioning of lithium battery.  (8)

2  **30901**

15. (a) (i) Explain the following properties of a lubricant :

(1) Viscosity and viscosity index

(2) Flash and fire point. (8)

(ii) What are abrasives? Explain Moh's scale of hardness. How is silicon carbide prepared? (8)

Or

(b) (i) Explain the manufacture of alumina and magnesite bricks. (8)

(ii) Write a note on solid lubricants. (8)

———