

TED (15) – 1004 (REVISION — 2015)

Reg. No.	
Signature	

FIRST SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/ TECHNOLOGY — APRIL, 2017

ENGINEERING CHEMISTRY - I

(Common to all Diploma Programmes except DCP)

[Time: 3 hours

(Maximum marks: 100)

PART - A

(Maximum marks: 10)

Marks

- I Answer the following questions in one or two sentences. Each question carries 2 marks.
 - 1. What are nanomaterials? Give two examples.
 - 2. What is heterogeneous catalysis? Write one example.
 - 3. What are conjugate pairs? Give one example.
 - 4. List any four physical properties of water.
 - 5. What is amalgum?

 $(5 \times 2 = 10)$

PART — B

(Maximum marks: 30)

- II Answer any five of the following questions. Each question carries 6 marks.
 - 1. Calculate the equivalent weight of (a) NaHCO3 and (b) Na2CO3.
 - 2. Calculate the molarity of solution prepared by dissolving 2g of NaOH in 500ml of water. What is its normality?
 - 3. Differentiate between atoms and molecules.
 - 4. What is temporary hardness of water? How it can be removed?
 - 5. What are carbon nanotubes? How they are classified? Explain.
 - 6. What is bleaching powder? How it sterilizes water?
 - 7. What are alloys? Explain fusion method for the preparation of alloys. $(5 \times 6 = 30)$



Marks

3

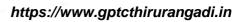
PART - C

(Maximum marks: 60)

(Answer one full question from each unit. Each full question carries 15 marks.)

		Unit — I	
III	(a)	Explain any three methods employed for the synthesis of carbon nanotubes.	6
	(b)	What are the different properties and applications of carbon nanotubes ?	6
	(c)	What is catalysis? Give two examples.	3
		OR	
IV	(a)	What are the applications of nanomaterials?	5
	(b)	Explain heterogeneous catalysis with two specific examples.	5
	(c)	Explain the classification of nanomaterials.	5
		Unit — II	
V	(a)	Using Lewis concept of acids and bases explain the formation of $\mathrm{NH_4}^+$ and $\mathrm{H_3O^+}$ ions.	5
	(b)	Find out the volume of 0.2M HCl required to neutralize 20ml of 0.1M NaOH.	5
	(c)	Explain the ionic product of water with necessary equations. What is its value?	5
		OR	
VI	(a)	Calculate the PH of 0.001M NaOH solution.	6
	(b)	What are the buffer solutions? Explain the types of buffer with examples.	6
	(c)	List any three applications of PH?	3
		Unit — III	
VII	(a)	Explain the steps involved in the making potable water with the help of flow chart.	6
	(b)	Differentiate between hard and soft water.	3
	(c)	Explain ion exchange method used for the removal of hardness with equations. OR	6
VIII	(a)	Explain reverse osmosis with necessary diagrams.	6
		Explain the different sterilization methods employed in the production of potable water.	6

(c) What are the characteristics of potable water ?





			Marks
		Unit — IV	
IX	(a)	Explain the terms:	
		(i) Annealing (ii) Quenching (iii) Tempering (iv) Nitriding	6
	(b)	Explain the various steps involved in powder metallurgy.	6
	(c)	What are the major purposes of making alloys?	3
		OR	
X	(a)	Write down the advantages, disadvantages and applications of powder metallurgy.	8
	(b)	What are the components of (i) Bronze and (ii) Duralumin?	4
		Write down any three physical properties of metals.	3

