



RM-6015

B. E. I (Sem. I & II) Examination

May / June – 2010

Engg. Chemistry

(New Course)

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांश लिखें निशानीवाणी विगतो उत्तरवही पर अवश्य लिखी. Fillup strictly the details of signs on your answer book.	Seat No. : <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
Name of the Examination : B. E. I (Sem. 1 & 2)	<div style="border: 1px solid black; border-radius: 15px; padding: 10px; width: 100%;">Student's Signature</div>
Name of the Subject : Engg. Chemistry (New)	
Subject Code No. : 6 0 1 5 Section No. (1, 2,.....) : 1&2	

- (2) Questions 1 and 4 are compulsory and carry 20 marks each.
- (3) Questions 2,3,5 and 6 are of 15 marks each.
- (4) Give reactions and neat labelled diagrams wherever necessary.
- (5) Use separate answer books for each section.
- (6) Specify question numbers to the answers attempted.

SECTION - I

- 1 (a) Fill in the blanks. 10
- (i) Hardness of water is expressed in terms of equivalent of_____.
 - (ii) Water containing dissolved salts having a peculiar salty taste is called_____ water.
 - (iii) During electrochemical corrosion, the corrosion occurs at the _____part.
 - (iv) In water treatment UV rays are used for_____.
 - (v) To retard the early initial setting of the cement, _____is added.
 - (vi) The steel bars or rods bear the _____stresses in RCC structures.
 - (vii) Bleaching powder causes the disinfection due to the formation of_____
 - (viii) As the temperature increases, the solubility of CaSO_4 _____.

- (ix) _____ is an example of the volatile oxidation product of a metal.
- (x) To prevent the dissolution of lime of concrete, the surface of concrete is coated with _____ in a soluble form together with oxides of Zn, Mg or Al.
- (b) Answer in short : 10
- (i) Draw the structure of Ca-EDTA complex and write the equations showing the colour change from wine red to pure blue during complexometric titration.
- (ii) What is Pilling-Bedworth rule?
- (iii) What do you understand by SCC?
- (iv) Draw a completely labelled diagram of a typical electrolysytic cell.
- (v) Write about any two methods of internal treatment of prevention of scale formation in boilers.
- 2** Answer any **five** : 15
- (i) Write a note on inhibitors.
- (ii) Coagulants are not required in the hot lime soda method of softening of hard water. Why?
- (iii) Write a note on RCC decay and its prevention.
- (iv) Give the differences between dry and wet methods of manufacturing of Portland cement.
- (v) Explain Break-Point chlorination.
- (vi) Write a note on the "Impressed current" method of cathodic protection to prevent the corrosion of a metal.
- (vii) Draw the completely labelled diagram of the "Rotary Kiln".
- 3** Answer any **three** : 15
- (i) Give in detail the "Ion exchange" method of softening of hard water.
- (ii) Explain the mechanism of electrochemical corrosion with the help of an example.
- (iii) Describe Pb/Acid Battery.
- (iv) Explain setting and hardening of Portland cement. Give chemical equations.
- (v) Explain complexometric method of estimation of hardness. Give chemical equations.

SECTION-II

- 4** (a) Fill in the blanks : 10
- (i) Thermosetting resins are formed by _____ polymerisation.

- (ii) Ozone layer depletion is caused by_____.
 - (iii) Smoke is a colloidal solution of_____in air.
 - (iv) VC-VA copolymer is used for the formation of textile fabric called_____.
 - (v) COD values are_____than BOD values during the sewage determination.
 - (vi) An example of natural abrasive is_____.
 - (vii) Diffusion current $I_d =$ _____.
 - (viii) Graphite is a _____ refractory.
 - (ix) Phenolphthalein shows _____colour in basic medium.
 - (x) Oxides of nitrogen and sulphur dissolve in rain water to give_____.
- (b) Answer in short :
- (i) Differentiate between COD and BOD
 - (ii) Write the structure and one use of phenol-formaldehyde resin.
 - (iii) Explain activated sludge treatment of sewage water.
 - (iv) Define pH-metry and write the Nernst equation.
 - (v) Draw Beer's curve showing the deviations. Give reasons for the deviations.

- 5** Answer any **five** : **15**
- (i) Describe injection method of moulding of Plastics.
 - (ii) Write a note on non-ferrous alloys.
 - (iii) Define and classify pollution.
 - (iv) Explain sewage treatment by trickling filter method.
 - (v) Write a brief note on "moulding constituents of plastics".
 - (vi) Give structure and uses of
 - (a) Plexiglass
 - (b) Teflon.
 - (vii) What is sewage? Define "Septic Tank".

- 6** Answer any **three** : **15**
- (i) Write about the experimental method of determination of COD of sewage.
 - (ii) Define Air pollution. Classify the Air Pollutants. Explain the use of cyclone collector.
 - (iii) Explain free radical mechanism of addition polymerisation.
 - (iv) Write about the principle and working of Flame photometry.
 - (v) Describe Lambert's and Beer Law. Derive the formula for optical density.