

KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Mechanical Engineering
B. Sc. Engineering 1st Year 1st Term Examination, 2018

Ch 1105
(Engineering Chemistry)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts.
ii) Figures in the right margin indicate full marks.
iii) Assume reasonable data if any missing.

SECTION-A

- 1(a) Classify polymers from different points of view. 10
- 1(b) "Polymers are macromolecules but all macromolecules are not polymer" – explain this statement with example. 07
- 1(c) Discuss the reaction mechanism of Cationic polymerization of ethene. 08
- 1(d) What is meant by conducting polymer? What are the advantages of conducting polymer over traditional polymer? 10
- 2(a) What is latex? Describe briefly the method of obtaining crude rubber from latex. 11
- 2(b) What is vulcanization? Why is it so important for making natural rubber workable? 07
- 2(c) What is meant by SBR? Briefly illustrate SBR with properties and uses. 09
- 2(d) What is compounding of crude-rubber? Shortly explain the function of accelerators and antioxidants agents in rubber. 08
- 3(a) Describe the manufacturing process of Polyvinylchloride (PVC). 11
- 3(b) "All fibers are polymer but all polymers are not fibers" – explain. 07
- 3(c) What are the differences between plastic and rubber? 08
- 3(d) Discuss the preparation, properties and uses of Teflon. 09
- 4(a) Write down the manufacturing process of conventional ceramic product with flow diagram. 11
- 4(b) Briefly illustrate the raw materials of glass manufacturing process. 08
- 4(c) What are the properties of optical and safety glass? 06
- 4(d) What is Glazing? Write down the purposes of Glazing and how it is done? 10

SECTION-B

- 5(a) What is electrophoresis? How does this phenomenon provide information that colloid particles are electrically charged? 12
- 5(b) Explain Dialysis and Electrodialysis methods for the preparation of sols. 10
- 5(c) Write down the difference between lyophilic and lyophobic colloid. 06
- 5(d) What is emulsifier? Write down the role of emulsifier. 07
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- 6(a) Explain that the fully exposed metal surface is more beneficial than the partially exposed metal surface from the corrosion point of view. 08
- 6(b) Discuss the electrochemical mechanism of corrosion with suitable diagram. 10
- 6(c) Nut and bolts are made of same metal in practice – why? 07
- 6(d) Write a short note on: 10
(i) Pitting corrosion (ii) Stress-corrosion cracking.
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- 7(a) Write down the composition of Portland cement. Discuss its manufacturing process by wet process. 13
- 7(b) Write down the reactions at different temperature that take place during burning of raw materials of cement in the rotary kiln. 12
- 7(c) Explain details the recovery of sugar from molasses. 10
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- 8(a) What is fertilizer? Write down the raw materials and manufacturing process of urea fertilizer with schematic flow diagram. 12
- 8(b) What are the function of sizing agent and bleaching agent for the manufacturing of pulp and paper? 08
- 8(c) Describe the following processes of making paper: 08
(i) Batting and
(ii) Calendaring.
- 8(d) Describe the method of testing or estimation of sugar. 07