

B.A./B.Sc. (General) Third Semester
Industrial Chemistry
Paper - A: Material Science

Time allowed: 3 Hours

Max. Marks: 75

NOTE: Attempt five questions in all, including Question No. I which is compulsory and selecting one question from each Unit.

x-x-x

- I. Write brief note on following:-
- Write down the applications of alloys.
 - Define ultimate tensile strength.
 - Give examples of commonly used oxidizing agents for organic compounds.
 - Write down any Friedel-Craft alkylation reaction.
 - Define esterification.
 - Write down the product obtained upon the nitration of nitrobenzene.
 - Define strain.
 - What is batch nitration?
 - Give examples of reagents used for halogenation reactions.
 - Give example of a metal-induced reduction reaction.
- (10 × 1.5)

UNIT-I

- II. a) Define ceramics. Write down their applications. Explain their manufacturing process in detail.
b) Differentiate between metals and alloys. (12, 3)
- III. a) Explain the manufacturing process of cement in detail.
b) Write a note on the composition of different types of cement.
c) Explain the science behind the setting of cement. (8, 4, 3)

UNIT-II

- IV. a) Write in detail about the commercial manufacturing of chloromethane.
b) Differentiate between aromatic side chain and nuclear halogenations. (10, 5)
- V. a) What is nitration? Discuss about various nitrating agents.
b) Give the mechanism of nitration of acetanilide to give p-nitroacetanilide. (5, 10)

UNIT-III

- VI. a) Discuss in detail the commercial manufacturing of maleic anhydride.
b) Explain liquid-phase oxidation in detail. (10, 5)
- VII. a) Write a note on the manufacturing of cellulose acetate.
b) Discuss the mechanism of: (i) Acid-hydrolysis of esters, (ii) Basic-hydrolysis of esters. (9, 6)

UNIT-IV

- VIII. a) Write in detail about the commercial manufacturing of p-aminophenol.
b) Explain the kinetics of hydrogenation reaction. (10, 5)
- IX. a) Write a note on the manufacturing of ethylbenzene.
b) Explain the thermodynamics of a hydrogenation reaction. (10, 5)