

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: M. PHARM.  
BRANCH: PHARMACY

SEMESTER : II  
SESSION : SP/22

SUBJECT: MPC204T Pharmaceutical Process Chemistry

TIME: 3:00 HOURS

FULL MARKS: 75

**INSTRUCTIONS:**

1. The question paper contains 7 questions each of 15 marks and total 105 marks.
  2. Candidates may attempt any 5 questions maximum of 75 marks.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
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- Q.1(a) Explain in-process quality control and validation of a large-scale process. [7]  
Q.1(b) Explain scale up process of an API quoting example of a case study related to it. [8]
- Q.2(a) What does make a liquid-liquid mixture a maximum boiling azeotrope? Explain the separation process of azeotropic mixture of ethanol-water with appropriate schematic. [7]  
Q.2(b) What is nucleation? Explain the recovery process of penicillin by solvent extraction with proper schematic. [8]
- Q.3(a) Describe the industrial production of TNT with a neat, detailed flow sheet. [7]  
Q.3(b) Draw a process flow diagram representing benzoic acid manufacture by toluene oxidation. Also, write the stoichiometric equation of the step producing chlorinated wastes in VCM manufacture and give examples of the wastes produced. [8]
- Q.4(a) Explain the production of methanol by bubble column reactor with neat diagrams. [7]  
Q.4(b) Describe the production of penicillin with a simple schematic diagram. [8]
- Q.5(a) Explain the various components of a Safety Data Sheets (SDS). [7]  
Q.5(b) Explain various stages of Effluent treatment with suitable diagrams and flowcharts. [8]
- Q.6(a) Explain the mechanism of surface filtration and depth filtration. Explain the working principles of plate-and-frame filter with schematic. [7]  
Q.6(b) Describe all the steps involved in production of KCl by shaft mining until crystallization. [8]
- Q.7(a) Depict various stages involved in upscaling of a small scale NCE to a large-scale API through a sequential flow diagram. [7]  
Q.7(b) Explain the importance of implementation of ISO 14001 with respect to a chemical industry. [8]

::::: 02/05/2022 :::::