

Exam Date & Time: 13-Sep-2021 (02:00 PM - 05:00 PM)



## MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.

**Pharmaceutical Process Chemistry [PCH-MPC204T]**

**Marks: 75**

**Duration: 180 mins.**

### SECTION - A

**Answer all the questions.**

Answer the following (10 marks x 5 = 50 marks)

- 1) Explain the principles of process green chemistry (5)
  - A)
  - B) Discuss the strategies used in the design of a process route to ensure adequate overall yield. Add a note on process excellence index (5)
- 2) Discuss the primary physical characteristics of a solvent to be considered for selection of a solvent for scale up. (5)
  - A)
  - B) Discuss on ICH guidelines on residual solvents (5)
- 3) Enlist various crystal properties and explain the basic crystal properties such as solubility, inclusion and occlusion (5)
  - A)
  - B) Explain the Cooling crystallization and Evaporative crystallization as crystallization process options (5)
- 4) Discuss case study on industrial halogenation process (5)
  - A)
  - B) Explain the types of catalytic hydrogenation with examples (5)
- 5) What are the characteristics of cost effective routes? Explain (5)
  - A)
  - B) What are the applications of supported reagents? Explain reagent support on alumina, silica, zeolite, PVPDC and clay. (5)

### SECTION - B

**Answer all the questions.**

Answer the following (5 marks x 5 = 25 marks)

- 6) Discuss on the techniques for characterization of pharmaceutical salts (5)
- 7) Enlist the contents of MSDS (2.5)
- A)
- B) How will you handle wet chemicals and dry powder fire extinguishers? (2.5)
- 8) Explain how effluents are treated in a pharmaceutical plant? (5)
- 9) What are liquid phase oxidation reactions? Explain (5)
- 10) With a neat diagram explain the process equipment of technical nitration (5)

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