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

CLASS: M. PHARM. **SEMESTER: II**
BRANCH: PHARMACY **SESSION: SP/2023**

SUBJECT: MPC204T PHARMACEUTICAL PROCESS CHEMISTRY

TIME: 3.00 Hours **FULL MARK: 75**

INSTRUCTIONS:

1. The missing data, if any, may be assumed suitably.
2. Before attempting the question paper, be sure that you have got the correct question paper.
3. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
5. Answer any five questions.

1a. Taking each section of Safety Data Sheets (SDS) into consideration explain the importance of SDS with respect to Pharmaceuticals. [7]

1b. Explain the working on an Effluent Treatment plant with suitable diagram. [8]

2a. Explain the different parameters and requirements of route selection with respect to reaction progress kinetic analysis. [7]

2b. Explain in detail the production of any antibiotic by using fermentation technology. [8]

3a. Explain in detail the production of any Vitamin by using fermentation technology. [7]

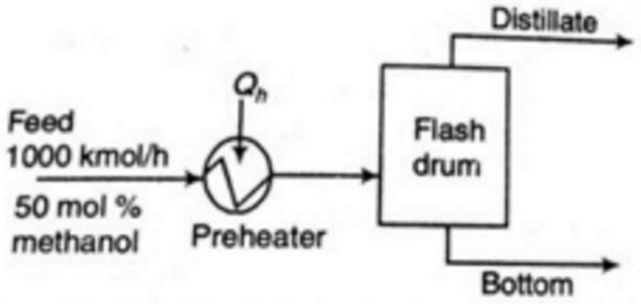
3b. Write notes on families of reagents useful for scale-up of a pharmaceutical synthesis. [8]

4a. Explain different stages of scale up process with suitable examples. [7]

4b. Write notes on impurities including genotoxic impurities found in API with respect to their sources. [8]

5a. Differentiate between extractive and azeotropic distillation. An equimolar mixture of A & B (A being more volatile) is flash distilled continuously at a feed rate of 100 kmol/h such that the liquid product contains 40 mole% of A. If the relative volatility is 6, then find the vapor product in kmol/h. [3+4]

5b. A flash distillation drum is used to separate a methanol-water mixture. The mole fraction of methanol in the feed is 0.5, and the feed flow rate is 1000 kmol/h. The feed is preheated in a heater with heat duty Qh and is subsequently flashed in the drum. The flash drum can be assumed to be an equilibrium stage, operating adiabatically. The equilibrium relation between the mole fractions of methanol in the vapor and liquid phases is $y^* = 4x$. The ratio of distillate to feed flowrate is 0.5. Find out the mole fraction of methanol in the distillate. [8]



6a. Write down the general procedure of the maceration process. What is the difference between a rotatory drum filter and a centrifugal filtration process? [3+4]

6b. What is MIER's supersaturation theory and what are the assumptions and limitations of this theory? [2+3+3]

7a. Mention the different types of halogenation methods and discuss about the kinetics of halogenation reaction. [3+4]

7b. Write down the engineering factors for nitration process. Discuss about the continuous nitration process. What are the applications of nitration products. [3+3+2]

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