Reg. No. | | | | | | | | | |

ICS 454

II Semester M.Sc. Degree Examination, September/October 2022
INDUSTRIAL CHEMISTRY
Chemical Engineering Technology

Time : 3 Hours Max. Marks : 70

***Instructions** : 1) Answer **any five** questions from Part – **A** and **any five** from Part – **B**.*

*2) Figures to the **right** indicate marks.*

PART – A

1. Answer **any five** sub-divisions. **(5×2=10)**

   a) What are the advantageous and disadvantageous of forced circulation evaporators ?

   b) How do you distinguish flash and steam distillation ?

   c) Write any four industrial applications of flow chemistry.

   d) State and explain Miers theory.

   e) How do you perform acylation and alkylation at Nitrogen ? Give one example.

   f) What is meant by Turkey red oil ? Write its structure.

   g) How do you prepare oxidizing agents ? Give examples.

   h) Write the structure of following compounds

      i) Cellulose acetate

      ii) Nitro-glycerine

      iii) Methyl methacrylate.

PART – B

2. a) With a neat labelled diagram, explain the working and applications of vacuum distillation.

   b) How fractional distillation is more useful in petroleum chemical industries.

   c) What do you mean by relative volatility and mention its significance.

(4+4+4=12)

P.T.O.

3. a) What are the azeotropes ? How do you classify the azeotropic mixture ?
   b) Discuss on horizontal type evaporators and their common applications.
   c) What are the limitations of Hennery's law ? **(4+4+4=12)**

4. a) Write a short note on flow chemistry.
   b) What is crystal growth ? Explain the nucleation theory of crystallization.
   c) Give a brief account on merits and demerits of plate and tower packing's. **(4+4+4=12)**

5. a) What is gas absorption ? How it is different from distillation ?
   b) Discuss about Swenson Walkers crystallizers.
   c) Give an account of continuous vacuum crystallizers. **(4+4+4=12)**

6. a) Write a short note on applications of active methylene compounds using dimethyl malonate.
   b) With flow chart discuss industrial manufacturing process of nitrobenzene.
   c) Write a short note on N-nitro compounds and its uses in industries. **(4+4+4=12)**

7. a) Define nitrate esters. How do you prepare nitrate esters ? Give its applications.
   b) With neat labelled diagram explain manufacturing process of Benzene sulfonic acid.
   c) Write a short note on nitration of paraffinic hydrocarbons. **(4+4+4=12)**

8. a) With the help of neat diagram, explain industrial manufacturing process of chlorobenzene.
   b) Discuss briefly about applications of oxidizing agents in industries.
   c) How do you prepare methyl methylacrylate in industries ? Explain with neat diagram and flow chart. **(4+4+4=12)**

9. a) Write a short note on industrial manufacturing process of ethyl acetate.
   b) Define catalyst. Discuss different types of catalyst used in industries.
   c) Write a short note on manufacturing process of Benzene Hexachloride (BHC). **(4+4+4=12)**

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