

--	--	--	--	--	--	--	--	--	--

II Semester M.Sc. Degree Examination, September/October 2022
INDUSTRIAL CHEMISTRY
Energy Systems, Colloids and Petrochemicals

Time : 3 Hours

Max. Marks : 70

Instructions : I) Answer Part – **A** and **any five** from Part – **B**.
II) Figures to the **right** indicate **marks**.

PART – A

Answer **any five** questions.**(5×2=10)**

1. a) What are batteries ? Give the classification of batteries with an example each.
- b) Mention different chemical energy sources, with example for each.
- c) Write the composition of petroleum.
- d) Explain the term Betz Limit.
- e) Mention different types of cracking. What is petroleum cracking ?
- f) Write differences between gel and emulsion.
- g) What is geothermal energy ? Mention different types of geothermal energy systems.
- h) Mention any four differences between physical and chemical adsorption.

PART – B

Answer **any five** questions.

2. a) Explain the construction, reactions and applications of Methanol Fuel Cell.
- b) Write a short note on Alkaline MnO₂ batteries.
- c) Explain the characteristics for batteries.

(6+4+2)**P.T.O.**



3. a) Write a short note on lithium based conducting polymer battery.
b) Discuss the construction, working and advantages of Lead-acid battery. (6+6)
4. a) Explain the principles of ocean thermal energy conversion system.
b) Discuss the physicochemical characteristics of biomass. (6+6)
5. a) Explain the principle and working of solar cells.
b) Explain the process of photo reduction of CO_2 and photoelectrochemical waste removal. (6+6)
6. a) How do we determine the particle size of colloids ? Explain any two methods in brief.
b) Mention different types of electrophoresis. Explain method of separation of protein by gel-electrophoresis. (6+6)
7. a) Explain different types of catalysis along with their industrial applications.
b) Write a note on Gibbs adsorption isotherm. Explain any two applications of adsorption. (6+6)
8. a) Explain the caustic washing and Merox process.
b) What is catalytic reforming process ? Explain the process with the help of a diagram and write the reactions involved. (6+6)
9. a) Explain the Bergius process for the production of synthetic petrol.
b) Discuss Fischer-Tropsch Method for petroleum cracking.
c) Explain the process of hydrocracking (4+4+4)
-