DEPARTMENT OF CHEMICAL ENGINEERING, MNNIT ALLAHABAD

END-SEMESTER EXAMINATION, B.TECH (V SEM), 2018-19

CHEMICAL TECHNOLOGY-II (CL-1504)

Max. Marks: 60 Time: 3 hrs

Note: Attempt all the questions.

1. **Answer the following questions:** [1*4= 4]

(i) Name the catalyst used during hydrogenation of coal.
(ii) Give the basic structure of penicillin.
(iii) Write the reaction step for preparing Raney nickel catalyst.
(iv) Which component is used as opacifier in soaps.

2. **Answer any eight of the following questions:** [3*8=24]

(i) Give the chemical reactions explaining digestion of wood pulp through Sulfate process.
(ii) Give the classification of coal.
(iii) List the major engineering problems associated with fermentation industry.
(iv) Differentiate between Edible and Essential oils
(v) Discuss the problems encountered in handling hydrogen during hydrogenation of oils.
(vi) Write the chemical reactions for saponification process.
(vii) Discuss the various types of detergents used for washing purpose.
(viii) What are the problems that may be faced when the reactor walls are contaminated with polymer materials? How can this problem be mitigated?
(ix) Differentiate between Visbreaking and Coking

3. **Answer the following:** [4*3=12]

(i) Explain: What is the need of carrying out hydroprocessing (hydrotreating or hydrocracking) operations in the petroleum refinery.
(ii) Explain how the analysis of coal is done?
(iii) Discuss the parameters and the operating conditions comparing Sulfate and sulfite processes.

4. **Answer the following:** [5*4=20]

(i) Give a detailed flow sheet and explain Ethyl alcohol production by fermentation.
(ii) Describe the methodology of Vegetable oil extraction with a flowsheet.
(iii) Discuss the operating conditions of Cracking process for petroleum fractions. What are the possible kinds of reactors employed for the process?
(iv) Which two polymerization methods are commonly used for the manufacturing polyvinyl chloride? Discuss the process on which maximum production is based (with a proper flowsheet).