



NATIONAL OPEN UNIVERSITY OF NIGERIA
UNIVERSITY VILLAGE, PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESS WAY, JABI - ABUJA.
FACULTY OF SCIENCES
DEPARTMENT OF PURE AND APPLIED SCIENCE
SECOND SEMESTER EXAMINATION 2021_2₂₀₂₁

COURSE CODE: CHM415
COURSE TITLE: INDUSTRIAL CHEMICAL TECHNOLOGY II
TIME: 2 HOURS
INSTRUCTION: Answer question one and any other three questions.

QUESTION ONE

- Enumerate the three principles of producing syngas based on feedstock used 3 marks
- With suitable equations, discuss the sources of hydrogen 6 marks
- Give elemental composition of crude oil and coal
4marks
- How can soya bean oil be manufactured by solvent extraction 6 marks
- Enumerate the major causing of Air pollution indicating the major and minor pollutant
6 marks

QUESTION TWO

- Explain the classification of natural gas 3 marks
- Discuss the component of a lignocellulosic biomass 4 ½ marks
- Describe full, the variable costs of producing a chemical 7½ marks

QUESTION THREE

- Discuss the fixed costs involved in producing chemicals 8 marks
- 10kg of a 10% (by mass) NaCl solution is concentrated to 50% in a continuous evaporation. Calculate the production rate of concentrated solution (c) and the rate of water removal (w) from the evaporator 4 marks
- Using an appropriate example, define the stoichiometric equation of a chemical reaction
3mk

QUESTION FOUR

- a. Enumerate the various characteristics of oil 4 marks
- b. Explain the techniques of extracting essentials oils 6 marks
- c. What are mineral oils 5marks

QUESTION FIVE

- a. Mention the factors to consider before collecting air samples and the devices needed for collecting samples 4 marks
- b. Enumerate the methods of disposing acid tars 4 marks
- c. Discuss the types of industrial waste and their methods of removal 7marks