

# KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS  
2019/2020 ACADEMIC YEAR

FOURTH YEAR SECOND SEMESTER  
MAIN EXAMINATIONS

FOR THE DEGREE OF B.ED (SCIENCE) AND BSC (CHEMISTRY)

**COURSE CODE:** SCH 400

**COURSE TITLE:** INDUSTRIAL CHEMISTRY

**DURATION:** 3 HOURS

**DATE:** 12<sup>TH</sup> NOVEMBER, 2020

**TIME:** 2:PM-5:00PM

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## INSTRUCTIONS TO CANDIDATES

- Answer **QUESTION ONE** (Compulsory) and any other two (2) Questions.
- Indicate **answered questions** on the front cover.
- Start every question on a new page and make sure question's number is written on each page.

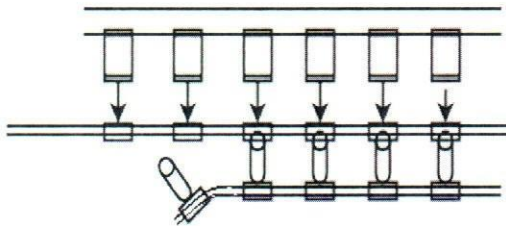
This paper consists of 4 printed pages. Please Turn Over



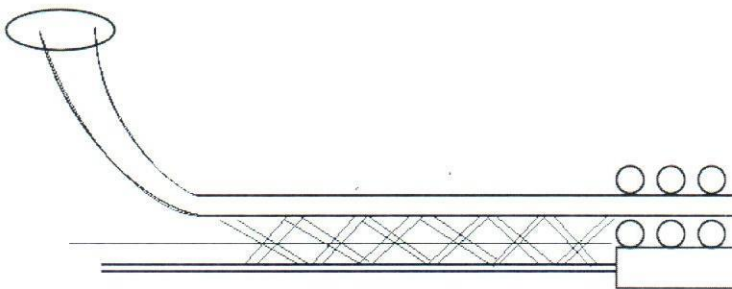
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## Question One (30 Marks)

- a) What are the main components of glass? In what ratio are the main components mixed? [03]
- b) Describe the processes involved in glass production? [04]
- c) How is colored glass made? [02]
- d) How is reflective glass made? [02]
- e) Why does glass protect against UV rays? [02]
- f) How are ceramics produced from glass? [02]
- g) How are raw materials 'fed' into the furnace? [02]
- h) Describe the method is used for the production of hollow glasses? [02]
- i) The following are methods of forming, used to produce sheet glass? [03]
- j) Which operation does the below figure represent? Explain. [02]



- k) Which forming operation does the below figure represent? [02]



- l) What is Glass transition temperature? [02]
- m) Generally, materials experience either ductile or brittle type of fractures. Differentiate between Brittle and Ductile fractures. [02]

## Question Two (20 marks)

- a) What are petrochemicals? [01]
- b) State any FOUR industrial uses of petro chemicals. [02]
- c) Using a suitable diagram/schematic chart, show how primary petrochemicals are produced in an oil refinery. [02]
- d) Ethylene is widely used in petrochemical industry as raw material for the production of plastics and industrial chemicals.
- Ethylene is produced industrially by **cracking**. Explain the meaning of cracking. [02]
  - Differentiate between Thermal cracking and catalytic cracking. [02]
  - Explain the advantages of catalytic cracking over steam cracking. [01]
- e) Ethanol and Ethan-1,2-diol (Ethylene glycol) are some of the chemicals that can be produced from ethylene.
- Write the chemical equations to show how ethanol and glycol are produced clearly indicating the conditions. [02]
  - State One industrial use for
    - Ethanol [01]
    - Ethylene glycol. [01]
- g)
- Ethylene can, treated differently form the following key monomers in industry.
    - Vinyl chloride
    - StyreneDraw structures for the two monomers. [02]
  - Why are additives added to polymers? Differentiate between stabilizers and plasticisers. [02]
  - State two forms of polystyrene. [02]

## Question Three (20 Marks)

- a) What are pesticides? [02]
- b)
- State any **Four** classes of pesticides by target organism: [02]
  - State any **three** types of pesticides according to chemical families. [02]

- 52
- iii. Explain briefly how a pesticides works. [04]
- c)
- i) What are '**carriers**' as used in pesticides and pest control? [02]
- ii) Examples of pesticide carriers. [02]
- d) Discuss the environmental impact of using pesticides. [02]
- e) Different techniques are employed by industry to recover priority pollutants during pesticide manufacturing. Explain any FOUR techniques of controlling pollutants by pesticides at source. [04]

### Question Four (20 Marks)

- a) Cement (sometime referred to as Portland Cement or hydraulic cement). What is Portland cement. [01]
- b) What are the raw materials used for manufacture of Cement? [02]
- c) What is the role of Gypsum in cement? [01]
- d) What is setting of cement? [01]
- e) What is meant by hardening? [01]
- f) Why should cement be "fine"? [01]
- g) What is meant by "Soundness of cement"? [02]
- h) What does 53, 43 & 33 grades indicates? [02]
- i) Does the color of cement affect the strength? [02]
- j) What are the reasons for slow setting & quick setting of cement? [02]
- k) Describe how Portland cement is made. (If possible include flow chart) [05]