KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

FOURT YEAR SECOND SEMESTER
MAIN EXAMINATIONS

FOR THE DEGREE OF B.ED (SCIENCE)

COURSE CODE: SCH 441E

COURSE TITLE: PHOTOCHEMISTRY

DURATION: 2 HOURS

DATE: 1/8/ 2018 TIME: 9-11AM

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 **3** printed pages. Please Turn Over

KIBU observes ZERO tolerance to examination cheating

Question one (30 marks)

a) What are photochemical reactions? Give any **ONE** example.**(1mks)**
b) What are thermal reactions? Give any **ONE** example.**(1mks)**
c) What is monochromatic light? Name any one source of the following radiation.**(3mks)**
   i. Ultra violet light
   ii. Visible light
d) Differentiate between the following phytophysical processes
   i. Fluorescence and phosphorescence.**(2mks)**
   ii. Chemiluminescence and bioluminescence.**(2mks)**
   iii. Cathadoluminescence and electroluminescence.**(2mks)**
e)
   i. State Einstein's law for photochemical reactions.**(2mks)**
   ii. What is quantum efficiency?**(1mks)**
   iii. What are the reasons of Low Quantum Yield?**(2mks)**
   iv. State **FOUR**differences between photochemical reactions and thermochemical reactions.**(4mks)**
f)
   i. What is ozone?Explain the occurrence of **'good ozone'** and **'bad ozone'** **(3mks)**
   ii. By use of chemical equations explain formation and dissociation of ozone.**(3mks)**
   iii. What are CFCs.State any one source of CFCs.**(2mks)**
   iv. By use of an appropriate mechanism, explain how CFCs lead to destruction of ozone.**(2mks)**

Question two (20 marks)

a) What is a photosensitizer?**(2mks)**
b) Photosynthesis is a fast reaction. State any **three** methods of measuring rates of fast reactions.**(3mks)**
c) What is the photosensitizer in photosynthesis?**(2mks)**
d) Propose a mechanism for the photocatalytic synthesis of starch in plants.**(12mks)**

Question three (20 marks)

a) What is photochemical smog?**(2mks)**
b) By giving examples differentiate between a primary and a secondary pollutant.**(3mks)**
c) What are the effects of photochemical smog?**(3mks)**
d) What factors affect photochemical smog formation?**(4mks)**
e) Discus the mitigation measures for photochemical smog.**(4mks)**
f) Using the London type smog and Los Angels type smog as case studies explain how the two phenomena of smog was formed and mitigated.**(4mks)**

Question four (20 marks)

a) What is photosensitization?**(2mks)**
b) In formation of glycerol from hydrogen and carbon (II) oxide, using mercury as a photosensitizer, propose a mechanism for the reaction.**(6mks)**
c) During the photodecomposition of HI to I_2 and H_2, propose a mechanism to show clearly the primary and secondary processes.**(6mks)**
d) In light induced photo-isomerization of benzene via Dewar benzene intermediate, show how the major product is formed.**(6mks)**