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(University of Choice)

MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

(Main Campus)

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

MAIN EXAMINATIONS

THIRD YEAR FIRST SEMESTER EXAMINATIONS

FOR THE DEGREE OF

BACHELOR OF SCIENCE DISATER PREPAREDNESS AND ENVIRONMENTAL TECHNOLOGY
AND
DISATER MITIGATION AND SUSTAINABLE DEVELOPMENT

COURSE CODE: DPE 306

COURSE TITLE: ENVIRONMENTAL MODELLING

DATE: 13/12/2023 **TIME: 3-5PM**

Instructions to Candidates

This paper contains FOUR (4) questions
Question **one is compulsory** {**total =30 Marks**}
Attempt **any other two** (2) {total = **40 Marks**} from the remaining questions
Be brief and to the point

MMUST observes ZERO tolerance to examination cheating

This Paper Consists of 2 Printed Pages. Please Turn Over →

SECTION 1: COMPULSORY {30 MARKS}

Question ONE

a) With the help of a sketch, illustrate five sub-models that comprise a complete model (6 Marks)

b) Briefly describe a model as a means of communicating Science and the results of science (4 Marks)

c) State the importance of modelling the environment (5 Marks)

d) With an aid of a diagram, briefly discuss Cause and Effect for estuary eutrophication due to excessive nutrient loadings (5 Marks)

e) State fundamental objectives of conceptual models (5 Marks)

f) Using a sketch, describe mechanistic models (5 Marks)

SECTION II: ATTEMPT ANY OTHER TWO (2) QUESTIONS {40 MARKS}

Question TWO

a) Discuss Reynolds Transport Theorem (RTT) using its general form of derivatives of integrated quantities (10 Marks)

b) With an aid of a sketch, state and discuss Scientific method (extended) for representations of real-world systems (10 Marks)

Question THREE

a) With an aid of sketch, discuss the role of conceptual models in the overall system qualify life cycle (14 Marks)

b) With an aid of a diagram, describe mathematical models in environmental modelling (6 Marks)

Question FOUR

With an aid of sketches, describe Kelly's and Manitoba models in disaster management (20 Marks)

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