KIBABII UNIVERSITY

2019/2020 ACADEMIC YEAR

THIRD YEAR FIRST SEMESTER

SPECIAL/SUPP EXAMINATIONS

FOR THE DEGREE OF BACHELOR OF SCIENCE IN RENEWABLE ENERGY AND BIOFUELS TECHNOLOGY

COURSE CODE: IET 312

COURSE TITLE: Wind and Wave Energy

DATE: 9/02/21

TIME: 8-10 Am

INSTRUCTIONS TO CANDIDATES

Answer question ONE and any other two questions

This paper consists of 2 printed pages. Please Turn over

a) Determine the wind speed at a height of 40 m over surface terrain with a few trees, if the wind speed at a height of 10 m is known to be 5 m/s. For your estimate use two different wind speed estimation methods.[**12 Marks**]

b) Using the same methods as part a), determine the wind speed at 40 m if the trees were all removed from the terrain.[**8 Marks**]

Question Five

(a) Briefly describe the operating principles of
  (i) An Oscillating Water Column
  (ii) A Tapchan scheme   [6 Marks]

(b)(i) Explain the benefit of using offshore as opposed to onshore or near shore wave devices and what offsets this?

(ii) Name two near shore wave energy converters, which do not use the operating principles of either of the onshore devices discussed in part (a).

State the characteristics of the Wells turbine that make it so suitable for use with wave energy converters   [14 Marks]