



## TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY  
DEPARTMENT OF BUILDING & CIVIL ENGINEERING

**UNIVERSITY EXAMINATION FOR:**

**SCHOOL BASED EXAMS**

BACHELOR OF SCIENCE IN CIVIL ENGINEERING

ECE 2304 : HYDRAULICS II

END OF SEMESTER EXAMINATION

**SERIES:** AUGUST 2017

**TIME:** 2 HOURS

**DATE:** Pick Date Aug 2017

### **Instructions to Candidates**

You should have the following for this examination

- Answer Booklet, examination pass and student ID
- Drawing Instruments

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

- Question one carries 30 marks and the rest carries equal marks (15 marks)
- This paper consists of TWO printed pages

**Do not write on the question paper.**

**Mobile phones are not allowed in the examination room.**

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### **QUESTION ONE (COMPULSORY)**

- Describe the work of a pump
- What does a reversible pump-turbine in its operations as either a pump or turbine depend on?
- When does a vane break
- Describe the two basic types of turbines
- Describe the idea behind baricly consists of continually pumping water away from the beach face.
- A centrifugal pump is to discharge water at the rate of 110 at a speed of 1450 rpm against a head of 23m. the impeller diameter is 250mm and its width 50mm. if the manometric efficiency is 75% determine the vane angle at the outer periphery.

### **QUESTION TWO**

- Describe two methods of coastal erosion controls

- b) A single arching reciprocating pump, having plunger diameter 125mm and stroke length 300mm is drawing water from a depth of 4m from the axis the cylinder at 24 pm. The length and diameter of suction pipe is 9m and 75mm respectively. Calculate the pressure head on the piston at the beginning and end of the suchonm stroke, if the barometers reads 10.3m of water.

### QUESTION THREE

- a) Describe the assumption made in developing the linear wave theory
- b) A channel of 5m wide is discharging  $20\text{m}^3/\text{s}$  of water. Calculate the depth of water when the specific energy of the following water is minimum.

### QUESTION FOUR

- a) Enumerate the fine factors that influence the formation of wind waves
- b) Enumerate what waves are characterized by
- c) Three wind waves develop over time, describe their
- d) Describe a breaking wave

### QUESTION FIVE

- a) Describe the term beach nourishment
- b) A pelton wheel has to develop 5000KW under a net head of 300m, while running at a speed of 500 pm. If the coefficient of velocity for the jet = 0.97 speed ration=0.4 and the ratio of the jet diameters =  $\frac{1}{10}$  of wheel diameter, calculate:
- Quality of water supplied to the wheel
  - Diameter of pitch circle
  - Diameter of jets
  - No of jets

Assume overall efficiency of the wheel as 80%