TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

HIGHER DIPLOMA IN BUILDING & CIVIL ENGINEERING (HDBCE 12S)

EBC 3202: HYDROLOGY I

END OF SEMESTER EXAMINATION
SERIES: APRIL 2013
TIME ALLOWED: 2 HOURS

Instructions to Candidates:
You should have the following for this examination

- *Answer Booklet*

This paper consists of **FIVE** questions.
Answer any **THREE** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One

a) With the aid of a sketch, describe the hydrologic cycle. **(8 marks)**

b) Define the following terms:
- **(i)** Evapotranspiration
- **(ii)** Isohyets
- **(iii)** Hydrograph
- **(iv)** Rainfall intensity
- **(v)** Infiltration
- **(vi)** Runoff **(12 marks)**

Question Two

a) Make a labeled sketch of a standard raingauge. **(6 marks)**

b) State **FOUR** advantages of recording gauges. **(4 marks)**

c) State **FOUR** sources of errors when making rainfall measurements. **(4 marks)**

d) Explain the procedure of determining the rainfall depth after using a standard raingauge. **(6 marks)**

Question Three

a) Sketch and label a USWB class A evaporation pan. **(6 marks)**

b) Outline **FOUR** factors that affect the rate of evaporation. **(8 marks)**

c) During a daily routine observation, 10.8 litres of water were added to bring the water level in an evaporation pan to the normal level. A nearby rain gauge measured 3.6mm of rainfall. Determine the evaporation for that day. The diameter of the evaporation pan is 1206.5mm **(6 marks)**

Question Four

a) A basin has an axial length of 230km an area of 26560km2 and a perimeter of 965km, determine the:
- (i) Form factor
- (ii) Compactness coefficient
- (iii) Elongation ratio
- **(iv)** Circularity ratio **(10 marks)**

b) The data shown in table 1 was obtained during a stream flow measurement exercise. Determine the stream discharge using the "MID-SECTION" method. **(10 marks)**

Table 1

Distance from left bank (m)	0	1.0	2.8	4.6	6.6	8.8

Depth of vertical (m)	0	0.60	1.20	0.80	0.60	0
Mean velocity in vertical (m/s)	0	0.72	1.31	0.83	0.68	0

Question Five

a) With the aid of sketch, illustrate the following:
   (i) Unconfined aquifer
   (ii) Confined aquifer
   (iii) Artesian well
   (iv) Perched water aquifer
   (v) Ground water table **(10 marks)**

b) In relation to ground water, define the following terms:
   (i) Aquifer
   (ii) Aquiclude
   (iii) Specific capacity of a well
   (iv) Specific yield
   (v) Permeability **(10 marks)**