JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DIPLOMA IN BUILDING AND CIVIL ENGINEERING

3RD YEAR 1ST SEMESTER 2018/2019 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TBC 2316

COURSE TITLE:

EXAM VENUE: **STREAM: DIP BLD & CIVEN**

DATE: ../12/2018 **EXAM SESSION:**

DURATION: 2 HOURS

Instructions

1. **Answer question 1 (Compulsory) and ANY other two questions**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

Question 1

Hydrological cycle is a model that describes the storage and movement of water between the biosphere, atmosphere, lithosphere and the hydrosphere. Therefore define the following terms;

a) Biosphere, atmosphere, lithosphere and hydrosphere. (4 Marks)
b) Condensation, Transpiration, Evapotranspiration, precipitation, Evaporation, runoff, percolation, infiltration and transportation with reference to hydrological cycle. (9 Marks)
c) Draw schematic diagram that self explains the term hydrological cycle. (7 Marks)

Question 2

The total area of a river basin whose surface runoff (due to a storm) drains into the river within the basin is taken as a hydrologic unit and is called drainage basin, watershed or catchment area of a flowing river.

a) Name five river basins that discharge there water into lake Victoria; are they part of Nile basin (write Yes or No); (5 Marks)
b) Define the following terms with reference to a river basins; Concentration time; concentration point , Water divide and drainage divide.(11 marks)
c) Write the formula for the hydrologic equation and explain the meaning with reference to a catchment. (4 Mark)

Question 3

A basin has an area of 26560 km2, perimeter 965 km and length of 230 km. Determine: (i) form factor, (ii) compactness coefficient, (iii) elongation ratio, and (iv)circularity ratio. (20 Marks)

Question 4

a) Define the terms hydrograph and Unit Hydrograph (6 Marks)
b) Explain the key terms (not more than seven steps) that defines the natural hydrograph from start till the end of it.(7 Marks)
c) State the seven steps that are adopted in derivation of a unit hydrograph from an observed flood hydrograph. (7 Marks)

Question 5

The data in the Table 1 below were collected for a stream at a gauging station by use of a current meter;

a) Identify and name the computation method used (0.45 Marks)
b) Write the needed equations for the computations (2 Marks)
c) and fill the spaces in the table using (b) (17.55 Marks)

Table 1: A Current Meter used Below a Water Surface

Distance from one end of water surface	Depth d (m)	Depth= xd = (0.6,0.2,0.8) (m)	Rev (R)	Time (sec)	$N = \frac{R}{t}$ (rps)	V = 0.3N + 0.005 (m/s)	Average Velocity in Strip V (m/s)	Discharge in Strip $\Delta Q = (bd)V$ b = 3m
3	1.4	……	12	50	0.24	……	……	……
6	3.3	……	38	52	0.73	……	……	……
		……	23	55	0.42	……		
9	5	……	40	58	0.69	……	……	……
		……	30	54	0.56	……		
12	9	……	48	60	0.80	……	……	……
		……	34	58	0.59	……		
15	5.4	……	34	52	0.65	……	……	……
		……	30	50	0.60	……		
18	3.8	……	35	52	0.67	……	……	……
		……	30	54	0.56	……		
21	1.8	……	18	50	0.36	……	……	……
							Total Q	= …… m^3

NB; d = depth, Q = discharge, R= revolutions, t = time, v = velocity, b = width of stream, rps = revolutions per second.