



MACHAKOS UNIVERSITY

University Examinations 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR FIRST SEMESTER EXAMINATION FOR DIPLOMA IN CIVIL ENGINEERING

BCECD 316: HYDROLOGY

DATE: 6/6/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

- This paper comprises of **five** questions
- Question **one** is **compulsory** and carry 30 marks
- Answer any **other two** questions

- Define the term hydrology (2 marks)
 - With a neat sketch, explain the processes in hydrologic cycle (15 marks)
 - Discuss 2 method used to measure precipitation (7 marks)
 - Explain 3 factors that affect evaporation (6 marks)
- Using the table below determine the mean rainfall using;
 - Arithmetic method
 - Thiessen polygon method (10 marks)

Station	Area	Precipitation
A	18	16.5
B	31	37.7
C	282	48.8
D	311	68.3
E	52	39.1
F	238	75.1
G	212	127.0
H	197	114.3

Note station A and E are outside the region

- b) Using the data given in the table below, determine the missing precipitation for station P using normal ratio method (10 marks)

Station	P	Q	R	S	T
Average annual precipitation	2400	2332	2431	2207	2231
Precipitation for year 2015	?	2113	2200	2028	2095

- c) Discuss the process of transpiration (5 marks)
- 3 a) Define the term run-off (2 marks)
- b) Discuss 5 factors that affect run-off flow (10 marks)
- c) Outline the process of run-off (8 marks)
- 4 a) Define the term flood (2 marks)
- b) Explain 5 causes of flood (10 marks)
- c) Discuss FOUR measures that can be put in place to reduce flood damage (8 marks)
5. a) Explain 5 classes of streams (10 marks)
- b) The following stage discharge observation were made at particular river gauge station

Stage(m)	0.70	1.2	1.7	2.0	2.5	2.70	3.1	3.3	3.7
Discharge m ³ /s	1.6	2.4	3.4	4.5	5.4	6.2	7.7	9.0	10.3

- a) Establish rating curves
- b) Prepare a sample rating table between 2m and 3m at interval of 0.1m (10 marks)