



MACHAKOS UNIVERSITY

University Examination 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING AND CIVIL ENGINEERING

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

DIPL0MA IN CIVIL ENGINEERING

BCECD 316: HYDROLOGY

DATE: 9/5/2019

TIME: 8:30 – 10:30 AM

Instructions to candidates

Answer question **ONE** and any other **Two** questions

1.
 - a) Define the term hydrology (2 marks)
 - b) Discuss Four measures that can put in place to reduce flood damages (8 marks)
 - c) Outline the process of run-off (8 marks)
 - d) Explain 5 factors that affect evaporation (10 marks)
 - e) State 2 methods of measuring precipitation (2 marks)
2.
 - a) With a neat sketch, explain the processes of hydrologic circle (15 marks)
 - b) Discuss the following forms of precipitation: -
 - i) rain
 - ii) dizzle (5 marks)
3.
 - a) Using the table below, determine the mean rainfall using: -
 - i) Arithmetic method
 - ii) Thiessen polygon method (10 marks)

Station	Area	Precipitation
A	20	17.00
B	40	40.2
C	280	50.3
D	324	76.5
E	54	40.5
F	283	85.7
G	210	130.2
H	185	115.3

Note station b and h are outside the region

- b) discuss the process of transpiration (5 marks)
- c) Using the data given in the table below, determine the missing precipitation for station p using normal ratio method (5 marks)

station	p	q	r	s	t
Average annual precipitation	2500	2432	2430	2208	2331
Precipitation for year 2016	?	2213	2400	2028	2100

4. a) Define the term run-off (2 marks)
- b) Discuss 5 factors that affect run-off flow (10 marks)
- c) Explain 4 causes of flood (8 marks)
5. a) Explain 5 classes of stream (10 marks)
- b) The following stage discharge observation were made at a particular river gauge station

Stage (m)	0.70	1.2	1.7	2.0	2.5	2.7	3.1	3.3	3.7
Discharge (m ³ /s)	1.6	2.4	2.4	4.5	5.4	6.2	7.7	9.0	10.3

- i) Establish rating curves
- ii) Prepare a simple rating table between 2m and 3m at interval of 0.1m

(10 marks)