



MACHAKOS UNIVERSITY

University Examinations for 2021/2022

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

DIPLOMA IN CIVIL ENGINEERING

BCECD 316 HYDROLOGY

DATE:

TIME:

Instructions:

- This paper consists of **Five** questions.
- Answer question **ONE** and any other **TWO** questions
- Maximum marks for each part of the question are as shown.

QUESTION ONE COMPULSORY (30MARKS)

- a) Define the term hydrology (2 marks)
- b) Discuss Four measures that can be put in place to reduce flood damages . (8 marks)
- c) Outline the process of run-off (8 marks)
- d) Explain five factors that affect evaporation (10 marks)
- e) State two methods of measuring precipitation (2 marks)

QUESTION TWO (20MARKS)

- a) With a neat sketch, explain the processes of hydrologic circle (15 marks)
- b) Discuss the following forms of precipitation: -
 - i. dew
 - ii. hail (5 marks)

QUESTION THREE (20MARKS)

- a) Explain five 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)	2	2.4	3	4.5	5.4	6.2	8	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)

QUESTION FOUR (20MARKS)

- 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 C and G 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	2315	2213	?	2028	2100

QUESTION FIVE (20MARKS)

- 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)