



MURANG'A UNIVERSITY COLLEGE

(A constituent college of Jomo Kenyatta University of Agriculture and Technology)

SCHOOL OF ENGINEERING

DEPARTMENT OF BUILDING AND CIVIL

UNIT CODE: SEB 1235

UNIT TITLE: HYDROLOGY

CLASS: BC/C 14D JAN

ACADEMIC YEAR: 2014/2015

SUPPLEMENTARY EXAM

DURATION: 2HOURS

DATE: 4TH August 2015

TIME: 8.00- 10.00PM

Instructions:-

- Question ONE is compulsory Attempt any other TWO questions.
 - Marks for each question are allocated at the end of each.
1. a. With a well labeled diagram describe the hydrological cycle **(5mrks)**
 - b. Define the following terms as they are used in hydrology **(6mrks)**
 - i. Watershed
 - ii. Interflow
 - iii. Infiltration
 - c. Explain the following forms of precipitation **(4mrks)**
 - i. Drizzle
 - ii. Shower
 - iii. Hail
 - iv. dew
 - d. Explain the factors that affect run off process **(4mrks)**
 - e. Distinguish the following type of precipitation **(6mrks)**
 - i. conventional **(5mrks)**
 - ii. orographic
 - iii. cyclonic

- f. From the measurements in the table below deduce the Average precipitation

Observed Ppt (inches)	Area*	% of total Area (m/s²)	Weighted Ppt
0.65	7	1	
1.46	120	19	
1.92	109	18	
2.69	120	19	
1.54	20	3	
2.98	92	15	
5.0	82	13	
4.5	<u>76</u>	<u>12</u>	

2. a. State four function of hydrology (4mrks)
- b. Explain how the following factors affect evaporation from an open water body (8mrks)
- i. Temperature
 - ii. Wind
 - iii. Relative humidity
 - iv. Atmospheric pressure
- c. Outline any two factors that affect runoff from a drainage basin (2mrks)
- d. Explain three climatic factors that affect runoff (6mrks)
3. a. Distinguish between a cold front precipitate and a warm front precipitate (2mrks)
- b. Describe rainfall run off process (3mrks)
- c. Explain three factors that affect infiltration process (6mrks)
- d. With the help of a sketch diagrams, distinguish between the following methods of determining areal precipitation (9mrks)
- i. Simple arithmetic
 - ii. Thiessen polygon
 - iii. Isohytal method

4. a. The above cycle is subjected to a number of interruptions at several stages. Briefly explain four of these interruptions **(8mrks)**

b. From the measurements in the table below deduce the Average precipitation **(12mrks)**

Isohyets (inches)	Area	Net area sq miles	Av Ppt(m)	Ppt volume
5	13	24	2.5	
4	90	14	0.8	
3	206	15	1.5	
2	402	147	5.3	
1	595	168	3.5	
<1	626	241	4.6	

5. a. Define the following terms **(4mrks)**

- i. Evaporation
- ii. transpiration

b. Explain the reasons for studying evaporation characteristics of a given site where a reservoir is to be constructed **(4mrks)**

c. Using well illustrated sketches describe three types of recording rain gauge **(6mrks)**

d. Discuss three methods used in the assessment of areal precipitation over an area explaining their advantages and limitations **(6mrks)**