

**UNIVERSITY OF SWAZILAND  
DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL SCIENCE AND  
PLANNING**

**MAIN EXAMINATION:                      DECEMBER, 2010  
B.Sc. II**

**TITLE OF PAPER                      :            WATER RESOURCES**

**COURSE NUMBER                     :            GEP 228**

**TIME ALLOWED                        :            THREE (3) HOURS**

**INSTRUCTIONS                        :            SECTION A IS COMPULSORY  
ANSWER ANY TWO QUESTIONS FROM  
SECTION B  
ILLUSTRATE YOUR ANSWERS WITH  
APPROPRIATE DIAGRAMS**

**MARKS ALLOCATED                    :            QUESTION 1 CARRIES 40 MARKS THE  
OTHER QUESTIONS CARRY 30 MARKS  
EACH**

**THIS PAPER IS NOT TO BE OPENED UNTIL PERMISSION HAS BEEN GRANTED  
BY THE INVIGILATOR**

**SECTION A: COMPULSORY QUESTION**

Question 1

- (a) Discuss the factors that affect runoff in a drainage basin. (15 marks)
- (b) Table 1 shows the current meter measurements for a certain river in Swaziland. Compute the discharge using the mean-section method.

(25 marks)

**(40 marks)**

Table 1. Current meter measurement for a certain river in Swaziland

Verical number	Distance from bank (m)	Depth (m)	Velocity $V_{0.6}$ (m/s)
0	0.0	0.0	0.0
1	3.0	1.9	0.35
2	5.5	3.2	0.37
3	8.5	5.0	0.45
4	10.0	7.0	0.70
5	15.0	6.0	0.50
6	17.5	3.0	0.4
7	20.0	2.0	0.3
8	23.0	0.3	0.20
9	23.5	0.0	0.0

**SECTION B: ANSWER ANY TWO QUESTIONS**

Question 2

Using Bergeron theory of precipitation formation, explain the different forms of precipitation received in the world.

**(30 marks)**

Question 3

- (a) Explain the importance of measuring water discharge. (15 marks)
- (b) Explain the importance of measuring meteorological variables. (15 marks)

**(30 marks)**

Question 4

Discuss the layering of the atmosphere.

**(30 marks)**

Question 5

(a) Explain the causes of the global wind belts.

(15 marks)

(b) The tropics do not get extremely hot and the polar regions not extremely cold.

Discuss the statement.

(15 marks)

**(30 marks)**