EXAM CORRECTION **Hydrology**

❖ **Answer to Question 1:**

- Literally, hydrology is "the science or study of water" (from Greek hudor and Latin logia (***There are other definitions. Refer to the Lesson).*** ……..**1pt**
- Climatology is a discipline closely related to hydrology. ……..**1pt**
- **Relationship between hydrology and climatology:**

Water cycle through the intervention of climatic factors in the processes of evaporation, evapotranspiration, and precipitation……..**1pt**

❖ **Answer to Question 2:**

Title : Watershed……..**1pt**

1 : devide/2.stream/3.principal stream /4.Outlet……..**3pt**

❖ **Answer to Question 3:**

Title : water cycle……..**1**

1.precipitation
2.evapotranspiration
3.evaporation
4.Infiltration
5. Goundwater Flow
6.evaporation

……..**0.5*6pt**

❖ **Answer to Question 4:**

a.Calculation of the Gravelius Shape Index (Kg_)

The formula is:

$$K_g = \frac{P}{2\sqrt{\pi A}}$$

where: ……..0.25

- P=14.7 km, (perimeter)
- A=6.5 km2 ;(area)

1.5

$$K_g = \frac{14.7}{2\sqrt{\pi \cdot 6.5}}$$

$$K_g \approx \frac{14.7}{2 \cdot 9.044} \approx \frac{14.7}{18.088} \approx 1.62$$

……..0.25

Gravelius Shape Index: Kg≈1.62……0.5

The watershed has an elongated shape……0.5

b.Calculation of the Overall Slope Index (Ig)

The formula is: Ig=D/L……0.25

$$I_g = \frac{H_{5\%} - H_{95\%}}{L}$$

Where:

- H5%=870 m
- H95%=678 m
- L=2.83 km=2830 m……..0.5

1.5pt

Ig=0.67……0.25

……..0.5

c. The double mass curve is used to correct the homogeneity of precipitation data……1pt

❖ **Answer to Question 5:**

- First we apply the arithmetic method $Px = \frac{80.79+67.59+76.28}{3} = 74.88mm$ 1.5Pt
- Then we calculate the variation

$\triangle = \left(\frac{92.01-74.88}{74.88}\right) 100 = 22.87\% > 10\%$ 2pt

- So, we use Normal Ratio Method 0.5

$Px = \frac{92.01}{3}\left(\frac{91.11}{80.79} + \frac{72.23}{67.59} + \frac{79.89}{76.28}\right)$

=96.75mm 1pt