

Name: _____

Student #: _____

Water Resource Management

Midterm sample

A. Terms: 10 Questions = 2 marks each (20)

B. 1 x 4 = 4

B. Short Answer: Choose 6 of 8 = 6 marks each (36)

Terms (Choose 10 of 11)

Flood Plain

Overland flood

Antecedent precipitation

Attenuation (radar term)

Stage (in hydrologic terms)

Negative-tilt Trough

Normal

Levee

Riparian Zone (in hydrologic terms)

ECMWF

Floodway (in hydrologic terms)

Part B

1. a Explain why typical rainfall is slightly acidic. Would you expect rain in the future to become: less, more, the same pH. Why? (2)

b. What qualifies as a "heavy rain day", i.e. 24-hour period? Circle correct amount
Equal to or more than 25mm 50mm 75mm 100mm (2)

Part C: Please answer ANY SIX of the following questions (6x 6 = 36)

1. Dams change the character of rivers. Discuss in point form

2. Compare Hydroelectric power production from location A and B.

P = $\rho h r g k$ where,

- **P is the electric power in watts**
- **ρ is the density of water (~1000 kg/m³)**
- **h is the height in metres**
- **r is the flow rate in cubic metres/second**
- **g is the acceleration from gravity of 9.8 m/s²**
- **k is the efficiency (coefficient of efficiency from 0 to 1. Efficiency is often near 1 with larger, modern turbines.)**

Location A has a height (“head”) of 58 m and a flow of 31 m³/s

Location B has a height (“head”) of 20 m and a flow of 48 m³/s

Divide your answers by 1000 to convert from watts to megawatts, the unit usually used for comparison.

3 Manitoba produces more hydroelectricity than Ontario. Compare/contrast Manitoba Hydro with Ontario (OPG). Discuss physical and socioeconomic reasons in Table format.

4 Discuss “Plan 1977”, part of the Great Lakes regulatory process.

5 Flash Flood Warning vs. Flood Warning. What's The Difference?

Weather forecasts and observed weather (radar and real time measurements) are essential parts of flood management. Discuss.

6 What is groundwater? Compare and contrast different types of aquifer and aquiclude. Explain how porosity and permeability determine the hydraulic conductivity of the groundwater systems.

7 -Describe different techniques of irrigation

-Review the geographical distribution of irrigation in Canada, differentiating major irrigation provinces from minor users.

8 The text '*Eau Canada: The Future of Canada's Water*' discusses many of the most critical water issues in Canada. With reference to two of these key issues describe how potential solutions would need to involve the public at large, water supply managers and environmental planners.