True / False questions are 1/2 point each.

1. Most of the Earth's fresh water is trapped in glaciers and ice sheets.  
2. Drinking water uses up as much as 10% of family income in some 3rd World countries.  
3. The water quality for drinking purposes is poor in the Corbett Park duck pond.  
4. The Aral Sea is growing in size and flooding shoreline communities.  
5. Lake source cooling is caused by El Nino.  
6. The process by which water enters the soil is called percolation.  
7. Trying to drive through flood waters is a very bad idea.  
8. The expression: \( \frac{1 \text{ liter}}{0.264 \text{ gallon}} \) has a value of 1.  
9. Drinking water makes up approximately equal portions of people's household budgets all around the world.  
10. The wetlands in Corbett Park was constructed to improve the water quality of the surface runoff from the Brockport campus.  
11. The Aral Sea disaster could have been predicted using a simple mass balance model.  
12. A dense vegetative canopy has a high hydraulic conductivity.

Multiple choice questions are 1 point each.

William Mulholland
- (a) received his degree in Civil Engineering
- (b) studied artesian aquifers
- (c) enabled the growth of Los Angeles into a large city
- (d) a and b
- (e) a and c
- (f) b and c
- (g) all of the above
- (h) none of the above

Which of the following is a unit of flow rate?
- (a) ft/sec  
- (b) cubic feet  
- (c) gallons/hour  
- (d) a and b
- (e) a and c
- (f) b and c
- (g) all of the above
- (h) none of the above

The Dennis Creek watershed project involves:
- (a) contaminated drinking water  
- (b) involvement of all community members and stakeholders  
- (c) coping with environmental impacts of animal agriculture  
- (d) a and b
- (e) a and c
- (f) b and c
- (g) all of the above
- (h) none of the above
The gated concrete structure between the storage basin/wetlands and the duck pond at Corbett Park

(a) is a tertiary treatment process
(b) forces storm water to be temporarily stored in the storage basin/wetlands area
(c) permits normal flows to pass through unimpeded
(d) a and b
(e) a and c
(f) b and c
(g) all of the above
(h) none of the above

Within a hydrologic system, inflow minus outflow equals

(a) runoff
(b) soil moisture
(c) change in storage
(d) all of the above
(e) none of the above

What natural feature(s) resemble(s) Darcy’s experimental apparatus?

(a) a confined aquifer
(b) a watershed
(c) a levee
(d) a and b
(e) a and c
(f) b and c
(g) all of the above
(h) none of the above

Values of the following questions are in parentheses.

(4) What problem do/did Mono Lake and the Aral Sea share? What are the causes of this problem? Has the problem been addressed in either case?

Outflows exceeded inflows over an extended time and both water bodies shrunk. In each case water was diverted upstream and used for a consumptive (loss) use. (Aral Sea: cotton irrigation; Mono Lake: municipal water supply for a distant city).

Aral Sea: problem is too big, countries too poor and dependent on cotton to do much - huge damage already done.
Mono Lake: Much of diversion stopped, system is recovering

(2) Why does a water resources specialist need to study some meteorology?

To understand the character of the important input (precip) to the hydrologic cycle.

(2) Improving water quality in Dennis Creek requires what skills in addition to engineering?

People skills - educating, motivating, and organizing the watershed residents to implement useful management practices.
(4) My house lot is \( \frac{1}{2} \) of an acre. How much would 2" of rain be worth if I were able to capture it and use it? (Monroe County water costs $2.12 per 1000 gallon, 1 acre = 43560 square feet, 1 cubic foot = 7.48 gallons)

\[
\text{Volume} = \text{depth} \times \text{Area} = (2" \times \frac{1 \text{ ft}}{12 \text{"}}) \times \left( \frac{\frac{1}{2} \text{ Acre}}{1 \text{ Acre}} \times \frac{43560 \text{ ft}^2}{1 \text{ Acre}} \right)
\]

\[
= 3630 \text{ ft}^3
\]

\[
= 27152.4 \text{ g}
\]

\[
\text{Cost} = \frac{2.12}{1000 \text{ g}} \times 27152.4 \text{ g} = $57.56
\]

(2) What is an aquifer pumping test? What is its purpose?

- Pump from a near well until equilibrium is reached or drawdown reaches a certain level or until certain time passes
- Either: Estimate well yield or characterize the conductivity of the aquifer

(3) What are the characteristics of a sustainable system? Name one water resource related system that is sustainable and one that is not.

\[ \text{Inflow } \geq \text{ outflow AND Everything priced at its true cost} \]

ex: 1. Irrigation from Ogallala aquifer
2. Monroe County Water Supply

(4) What is a levee? What is it intended to do? What are several reasons that it might cause one to weep and moan?

- Raising the banks of a stream to keep water from flooding out of the stream channel
- When they fail, the flooding results are often severe
- Building levees is/was a poorly paid, dangerous job

(2) What are four possible fates of a falling raindrop?

- Interception followed by evaporation
- Interception " " stemflow or drip flow
- Throughfall " " by runoff
- Infiltration