1. Rainfall - Runoff. Frances worked last summer designing a golf course near Lake Oconee (4 pts ea).

(a) The state climatologist recommends that turf gets irrigated with one inch of water each week if there is no rain. How many acre feet of water would this be if Emily irrigates 180 acres once per week?

Acre-Feet/week = __________

(b) How many gallons is this if an acre is 43,560 ft\(^2\) and there are 7.48 gallons in a cubic feet?

Gallons/week = __________

(c) How many people would this supply if each person uses fifty gallons per day?

People = __________

(d) Christina plans to use a five-acre water hazard (pond) that is six feet deep to supply the irrigation water. How many weeks supply of water would this provide?

Weeks = __________

(e) No rain fell during the early summer and the pond completely dried up, but then Tropical Storm Allyse dumped eight inches of rain. Calculate the runoff depth using a Curve Number of 65.

\[
Q = \frac{(P - I_s)^2}{P} \quad \text{with} \quad P = I_s + S = I_s + F + Q
\]

Curves on this sheet are for the case \(I_s = 0.25\), so that

\[
Q = \frac{(P - 0.25)^2}{P + 0.85}
\]

\[
Q \ (\text{in}) = __________
\]

(f) Calculate the volume of runoff for a watershed area of 2000 acres, and indicate whether this is enough to fill the pond.

Volume (AF) = __________
2. Erosion.

(a) Identify the following factors in the Universal Soil Loss Equation (1 pt ea.):

<table>
<thead>
<tr>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>P</td>
</tr>
<tr>
<td>K</td>
<td>T</td>
</tr>
<tr>
<td>LS</td>
<td></td>
</tr>
</tbody>
</table>

(b) Calculate the soil erosion loss in tons per acre per year for \( R = 100, \ K = 0.10, \ LS = 3, \ C = 0.50, \ P = 0.6 \) and \( T = 3 \). (2 pts)

\[
\text{Soil Loss} = \frac{A \cdot R \cdot K \cdot LS \cdot C \cdot P \cdot T}{100,000}
\]

(c) Is this an acceptable soil loss? (1 pt)

3. Streamflow. Complete the following table using data that Jeff collected in a stream. (6 pts)

<table>
<thead>
<tr>
<th>Interval</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
<th>(e)</th>
<th>(f)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance (ft):</td>
<td>1.5</td>
<td>4.5</td>
<td>7.5</td>
<td>10.5</td>
<td>13.5</td>
<td>16.5</td>
</tr>
<tr>
<td>Width (ft):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth (ft):</td>
<td>1.4</td>
<td>1.9</td>
<td>2.1</td>
<td>2.1</td>
<td>2.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Velocity (ft/s):</td>
<td>0.1</td>
<td>1.1</td>
<td>2.1</td>
<td>1.9</td>
<td>1.3</td>
<td>1.3</td>
</tr>
<tr>
<td>Area (ft(^2)):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow (cfs):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(a) What is the total stream area? (Hint: Add up the areas) (3 pts) \( A (\text{ft}^2) = \) 

(b) What is the total streamflow? (Hint: Add up the flows) (3 pts) \( Q (\text{cfs}) = \) 

(c) What is the average velocity? (Hint: \( \bar{v} = \frac{Q}{A} \)) (2 pts) \( \bar{v} (\text{ft/s}) = \) 

4. Fill in the blank (2 pts ea):

(a) Name of equation used to predict water velocity using channel roughness

(b) Name of equation used to predict sheet erosion

(c) Land use with high erosion and unit peak flows

(d) Land use with low erosion and unit peak flows

(e) Primary landscape source of water for baseflow

(f) Primary landscape source of water for stormflow

(g) Primary material in bedload

(h) Cause of most historic sediments in Georgia streams

(i) Primary carcinogen in tobacco smoke

(j) Kind of contamination in groundwater near auto salvage yards

5. EXTRA CREDIT (5 points!!) - Faculty and Teaching Assistant Evaluations - eval.franklin.uga.edu
6. On the graph below, sketch two runoff curves, one for a bare soil and a second for a mulched soil, for a storm with a constant precipitation rate. (6 pts)

Give three reasons why they are different. (2 pts ea)

(a) 

(b) 

(c) 

7. Watershed Delineation: Andrew lives along the Satilla River (southeast Georgia), which is one of the few rivers without a dam to flow into the Atlantic Ocean in the United States.

(a) Delineate the watershed including its tributaries using the map below (5 pts)

(b) What is the approximate area of this watershed? (3 pts) 

\[ A (\text{mi}^2) = \]