1. ___________ _________ is the most important geologic agent in eroding, transporting and depositing sediment. Nearly every landscape on Earth shows the results of stream erosion or deposition.

2. Define the following components of the Hydrologic Cycle.
   a. Evaporation ________________________________________________________________
   b. Precipitation ________________________________________________________________
   c. Transpiration ________________________________________________________________
   d. Runoff ________________________________________________________________
   e. Condensation ________________________________________________________________
   f. Infiltration ________________________________________________________________

3. Pretend you are a water molecule, and describe or draw your travels through the Hydrologic Cycle. Include in your answer the following water pathways: sun, ocean, clouds, lakes and/or rivers, groundwater, plants, animals, rain and/or snow, evaporation, precipitation, transpiration, runoff, condensation, and infiltration (30 pts).

4. A ___________ is a body of running water, confined to a channel, that runs downhill under the influence of gravity.
5. Define the following components of a stream.
   a. Headwaters
   b. Mouth
   c. Channel
   d. Stream banks
   e. Streambed
   f. Floodplain

6. A ________________ _____________ is the total area drained by a stream and its tributaries.

7. A ___________________ is a small stream flowing into a larger one.

8. The ______________________ Divide separates the streams that flow into the Pacific from those that flow into the Atlantic and Gulf of Mexico.

9. Name the following stream drainage patterns and give an example of where you would expect to find each type (8pts).

10. Stream erosion (and deposition) is controlled by flow ________________ and ________________.

11. Stream velocity is controlled by stream ________________ (slope), channel ________________, and channel ________________.
12. (Higher/Lower) stream velocities promote erosion and transport of courser sediments.

13. Stream __________________ is the downhill slope of the streambed and is typically measured in feet per mile. It usually decreases downstream.

14. __________________ and deeper channels allow for faster flow.

15. __________________ channels allow for faster flow.

16. __________________ and shallower channels decrease flow speed.

17. __________________ channels decrease flow speed.

18. Stream discharge is the volume of water flowing past a given point in a unit of time and is measured in cubic feet per second (cfs). The equation is:

\[
\text{Discharge (cfs)} = \text{Average stream width (ft)} \times \text{Average stream depth (ft)} \times \text{Average stream velocity (ft/sec)}.
\]

What is the discharge of a stream that is 100 feet wide, 15 feet deep, and has a velocity of 6 feet per second (show your work) (5pts)?

19. Define the following components of stream erosion and sediment transportation:
   
a. Hydraulic action __________________________________________________________
   b. Solution ________________________________________________________________
   c. Abrasion ________________________________________________________________
   d. Bed load ________________________________________________________________
   e. Suspended load ____________________________________________________________
   f. Dissolved load ____________________________________________________________

20. A __________________ is a broad strip of land built up by sedimentation on either side of a stream channel.

21. A _________________ is a body of sediment deposited at the mouth of a river when flow velocity decreases.

22. An ______________________ is a large, fan- or cone-shaped pile of sediment that forms where stream velocity decreases as it emerges from a narrow mountain canyon onto a flat plain, typically in arid regions.

23. Flood data that is collected on various rivers throughout the U.S. can be used to calculate the recurrence intervals of major flood events. The Sevier River has discharge data that has been collected since 1914. The following equation is used to calculate the recurrence interval:

\[
\text{Recurrence interval (R)} = \frac{n + 1}{m}
\]

n is the number of years of record (which is 96 years for the Sevier River)
m is the magnitude rank.
<table>
<thead>
<tr>
<th>Water Year</th>
<th>Peak Discharge (cfs)</th>
<th>Magnitude Rank (m)</th>
<th>Recurrence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>2,500</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1941</td>
<td>2,270</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>1973</td>
<td>1,660</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>1,650</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>1914</td>
<td>1,570</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>1,300</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>1952</td>
<td>1,240</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>1984</td>
<td>1,230</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>1949</td>
<td>1,210</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>1979</td>
<td>1,200</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1942</td>
<td>1,160</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>1916</td>
<td>1,120</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>1,030</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>1980</td>
<td>1,000</td>
<td>14</td>
<td></td>
</tr>
</tbody>
</table>

Using the table above, calculate the recurrence interval for each year of record discharges.

24. If the largest peak discharge on record occurred in 1983, when can we expect another peak discharge of this magnitude (year)?

25. Name two causes of urban flooding (2pts).

26. Several rivers have been set aside as “wild rivers” on which dams cannot be built. Give two arguments against building dams on rivers, and two arguments for building dams on rivers (4pts).

Against:

Against:

For:

For:

27. What affect would global warming have on the overall water budget in the Hydrologic Cycle (5pts)?

28. Discuss the similarities and differences between deltas and alluvial fans (5pts).