

ST/STE Pretest 2015 3.3

1. Which environmental problem leads to dead trees, especially if they're at high altitudes?

- (A) Global warming
- (B) Acid rain
- (C) Soil contaminants like mercury
- (D) Ozone depletion

2. What contributes SO<sub>2</sub> which eventually becomes part of acid rain?

- (A) Combustion of C-containing fuels
- (B) Roasting metal ores and burning S-containing fuels
- (C) High temperatures in engines
- (D) Use of refrigerants and sprays

3. Where on Earth is the largest depletion of ozone?

- (A) Antarctica
- (B) Arctic Circle
- (C) Greenland
- (D) Himalayas

4. The porosity of rock will influence how fast water from a watershed is delivered to a river or bay. The factor being described here is \_\_\_\_\_

- (A) Climate
- (B) Geology
- (C) Topography
- (D) Vegetation



5. The Ottawa river which flows through our nation's capital part of what major watershed? \_\_\_\_\_

- (A) Hudson Bay
- (B) Lake Champlain
- (C) St. Lawrence River
- (D) Ungava Bay

6. An ice floe (small) is to sea ice what a glacier is to an \_\_\_\_\_.

- (A) Iceberg
- (B) Ice cube
- (C) Ice cap
- (D) Ice cream



ST/STE Pretest 2015 3.3

7. What name is given to permanently frozen ground?

- (A) Permafrost
- (B) Ice cap
- (C) Snow
- (D) Tundra

8. What greenhouse gas is released by decomposers when permanently frozen ground begins to thaw?

- (A) Carbon dioxide
- (B) Nitrous oxide
- (C) Water
- (D) Methane

9. What organisms convert waste into phosphates?

bacteria

10. What two P-containing polyatomics are absorbed directly by plants?

$\text{PO}_4^{3-}$  and  $\text{HPO}_4^{2-}$

11. a) What comes first? Eutrophication? or **Runoff?**

b) In which two cycles, does eutrophication occur because of excess nutrients in lakes?  
**P and N**

c) Aside from shallow lakes, excess algae, oxygen depletion and dead fish, what else can eutrophication lead to?

**Release of toxic substances by blue green algae**

12. a) When ice floats, what two forces are balancing each other out?

**Buoyancy and gravity**

b) If the ice is moved to sea water of a greater density, what will happen to the amount of ice sticking out of the water? (More? Less? The same?) **more ice will stick out**

**$V_{\text{dw}}/V_{\text{ice}} = d_{\text{ice}}/d_{\text{w}}$  will be lower because  $d_{\text{w}}$  is higher for sea water. If there's less submerged ice than that means more is sticking out.**

c) Will a full glass holding an ice cube overflow with water after the ice melts? **NO**

d) If water- ice sinks in alcohol, will the volume of the alcoholic drink shrink after the completely submerged ice melts?

**YES**



13. a) Which layer of the ocean is subject to the most dramatic changes in temperature?

The mixing layer.

b) Why?

It absorbs the most light and is the one in contact with the most air.

14. How do  $\text{HCO}_3^-$  ions end up in the ocean?

From the weathering of rocks.

15. List two ways that carbon from the continent or atmosphere ends up in the ocean.

a) Ocean water dissolves it directly from the atmosphere: water + carbon dioxide  $\rightarrow \text{H}_2\text{CO}_3$

b) It receives hydrogen carbonate from weathered rocks.

16. Why is London warmer than Gaspé in the winter. Gaspé is cooled by the Labrador current while London is warmed by the Gulf Stream.

17. What three factors affect ocean currents?

1) latitude      2) season      3) depth

18. What three factors affect ocean currents?

1) Wind      2) tides      3) thermohaline current due to density differences (salty water is more dense than fresh water; cold is more dense than warm up to 4°C)

19. If a sample from the Gulf of St. Lawrence has a salt concentration of 12 000 ppm, what is its concentration in %m/V?

$$12\,000 \text{ mg/L} = 12 \text{ g}/1000 \text{ ml} * 100\% = 1.2 \%$$

STE Flashback: see website ( topics: kinetic/potential energy, weak electrolytes, fission versus fusion; concentration in moles/L)