

Ethanol in Minnesota: Farm to Fuel Review

NAME: _____

- 1) True or False: Crude oil is a fossil fuel that was formed over hundreds of millions of years by tiny plants and animals buried underneath layers of sand, silt and other rock.
 a) True b) False
- 2) Which of the following is not an accurate statement about petroleum?
 - a) Crude oil is extracted from the earth and refined to produce fuels and other common products like chemicals and plastic.
 - b) A majority of vehicles on the road today fuel with petroleum-based fuels.
 - c) Petroleum is a renewable resource with unlimited supply.
- 3) Which fuel is in most demand from U.S. oil refineries?
 - a) Diesel
 - b) Gasoline
 - c) Jet Fuel
- 4) Minnesota has fossil fuel resources within the state.
 - a. True
 - b. False
- 5) Which part of the corn kernel is most commonly used to make ethanol?
 - a) Protein
 - b) Oil
 - c) Starch
- 6) In the ethanol production process, _____ are used to break down starch into sugars, which are then converted into liquid fuel.
 - a) Enzymes
 - b) Oil
 - c) Yeast
- 7) In addition to fuel, the ethanol production process results in valuable coproducts, including:
 - a) Distillers Grains
 - b) Carbon Dioxide
 - c) Corn Distillers Oil
 - d) All of the above
- 8) True or false? In 1908 Henry Ford developed the Model-T as a flex fuel vehicle which could run on a combination of gasoline and ethanol.
 - a. True
 - b. False
- 9) One important characteristic of ethanol is that it helps increase octane when blended with gasoline. Ethanol has an octane rating of:
 - a) 84
 - b) 87
 - c) 91
 - d) 113
- 10) During this process, plants use solar energy to convert carbon dioxide and water into usable energy.
 - a) Respiration
 - b) Photosynthesis
 - c) Reproduction

11) Use of ethanol results in:

- a) Reduced lifecycle greenhouse gas emissions
- b) Reduced dependence on petroleum fuels
- c) Increased energy security
- d) Support for local farmers and businesses involved in agriculture and ethanol production
- e) All of the above
- f) B, C, and D

12) Ethanol can be used in varying percentages in different vehicles. Match the ethanol percentage to the vehicle/equipment group(s) that can use each blend. Some may have more than one answer, include all that apply.

(A) E85 **(B)** Mid-level ethanol blends (E20, E30, E40 or E50) **(C)** E10 **(D)** E15

All gasoline vehicles, motorcycles and small engines C

Any gasoline vehicle model year 2001 or newer C, D

Flex Fuel Vehicles A, B, C, D

13) Describe how ethanol can help the U.S. and the state of Minnesota meet goals for 1) reducing dependence on petroleum fuels or 2) reducing emissions/climate change.

___ Discussion may include potential for reduction in gasoline use/demand from various ethanol blend options or explanation of how biobased fuels can reduce lifecycle greenhouse gas emissions.
