

Part II: Short Answer Questions. Write a brief, but complete answer to each question, confining your answer to the space provided.

- (9) 1. Describe **how** three different processes used in the refinement of crude oil can help meet the high demands for gasoline used to power our cars.

fractional distillation – separates hydrocarbons by their boiling points to produce straight-run gasoline.

catalytic cracking – cuts longer hydrocarbons into shorter pieces that have the correct boiling points to be included in the gasoline fraction.

catalytic reforming – introduces branch points in hydrocarbons to lower their boiling points and make them smoother burning.

- (8) 2. (a) Why doesn't soap work well in hard water?

The minerals in hard water (calcium, magnesium and iron) bind to the fatty acids of soap and form an insoluble film which cannot bind to the grease and dirt.

- (b) Why do detergents work better than soap in hard water?

Detergents do not contain fatty acids and the surfactants in some types of detergents will not bind to the minerals in hard water. Also, detergents have additional ingredients (builders and suspension agents) that soften water and keep grease and dirt suspended.

- (8) 3. Power plants convert energy from one form to another to help meet our energy needs. **List in sequence** the forms that this energy takes from its arrival at a power plant to its departure.

1. *potential energy (chemical bond energy)*
2. *heat energy*
3. *mechanical energy*
4. *electrical energy*