AP® HUMAN GEOGRAPHY
2010 SCORING GUIDELINES

Question 1

According to Alfred Weber's theory of industrial location, three factors determine the location of a manufacturing plant: the location of raw materials, the location of the market, and transportation costs.

Part A (2 points)

Using an example of a specific industry other than the one portrayed on the map above, explain under what conditions an industry would locate near the market.

Examples of appropriate industries	Explanation (1 point)
Soft-drink bottling Bread products	Weight/bulk are gained in processing/manufacturing; therefore the industry locates close to the market in order to minimize transportation costs.

Note: The industry identified must match the explanation.

Part B (2 points)

Using an example of a specific industry other than the one portrayed on the map above, explain under what conditions an industry would locate near raw materials.

Examples of appropriate industries	Explanation (1 point)
Copper smelting Lumber products used for paper or furniture	Weight/bulk are lost in processing/manufacturing; therefore the industry locates close to the source of raw materials in order to minimize transportation costs.

Note: The industry identified must match the explanation.

Part C (2 points)

Using the map above and Weberian theory, explain the geography of ethanol plants in the United States.

Factor for plant location (1 point)	Explanation (1 point)
Plants are located close to the key raw material of corn <u>in order to minimize transportation costs</u>.	Ethanol is a weight-/bulk-losing industry. Corn is bulky; thus plants are built close to the supply of raw material in order to minimize transportation costs and maximize profit.

Note: "Explain" in this case should mean "tell why." The explanation should be linked to Weber's theory and discuss the weight-loss situation, or the second point is not awarded.

Write in the box the number of the question you are answering on this page as it is designated in the exam.

1A 1 of 2

1

A. An industry would be near the market in bulk-increasing products, or industries whose final output is heavier and more expensive to transport. An example of this kind of industry would be many automobile industries. Parts that make up a car are fairly crude and require relatively less care, and a good deal lighter than the final product. Cars, however, are heavier and more delicate, and especially if overseas, is considerably more costly to transport. It would therefore be less costly to be located nearer to the market place.

B. An industry would be near the raw materials in bulk-reducing products, or industries whose final product weigh less and does not require much special consideration to transport. An example of this kind of industry is the paper industry. The raw material, most typically wood, is heavy and considerably more costly to transport than paper, which is light and resilient. It would therefore be cost-effective for paper industries to be located nearer to forests than the market.

C. The industries, as the map suggests, are largely located near the corn fields, with the exception of a few outlier firms in places with little fields. The Weberian theory states that the relative distance of the industry from raw material to market place is the most ideal balance

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between cost of transportation of raw material and final product. This would suggest that ethanol is a bulk reducing product, as it is much more profitable to be located near the major corn fields surrounding the great lakes. This also suggests, however, that the cost of ethanol is likely to be higher outside of this zone. The distribution of corn fields can be explained by the readily available humidity and irrigation affected by the lakes. This show The Weberian model demonstrates that ethanol is more cheaply transported than the corn used to make it.

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A) An example that of an industry that would locate near the market is a soda botting industry. The empty bottle / can is imported in, as well as ingredients such as water, syrup, etc. As the product is made, with the ingredients mixed together and then poured filled into the bottles, the overall good weighs more than it originally did as an import. Because of the weight, transportation becomes more expensive, since it has gained weight from all the imports. This would be known as a bulk gaining industry. Bulk gaining industries prefer to locate near markets so that the time it takes to deliver a product is reduced, meaning transportation costs go down / decrease as well.

B) An example of an industry that would locate near the location of raw materials is an iron ore mill / factory. This would be classified as a bulk-reducing industry because the weight after the final product weighs less than the imports. Iron ore has to be mined from the ground as unpure iron. After its mined, it has to be transported to the mill / factory to be smelted, cleaned, & purified to become pure iron. Because the weight of the unpure substance is quite high, it would be unreasonable for a company to have it imported

Write in the box the number of the question you are answering on this page as it is designated in the exam.

1B 2 of 2

① 2 of 2

to the factory at such a heavy weight because of the high transportation cost. So, if the industry was located closer to raw materials, it could be processed and then transported to the location of the market at a ~~lower~~ lower price; also, this means a higher profitability rate, because the iron would weigh less to be transported, so it would be cheaper.

c. The geography of ethanol plants shown on the map shows that they are ~~located~~ densely populated where the acres of corn in a county is abundant. There are a few ethanol plants sparsely populated along the west coast, such as Washington and California, and the east coast, in New York, because of the access to major markets and seaports. The majority is located in the Mid West where the eastern side of North & South Dakota are located to the western side of Indiana. This is because Illinois is located in the mid west, which is home to Chicago, the largest industrial center. It's within close proximity to raw materials and the market, therefore reducing transportation costs theorized by Alfred Weber.

Write in the box the number of the question you are answering on this page as it is designated in the exam.

IC 1 of 2

1

1. (A) Industries in which their goods are perishable locate near the market so that they can deliver the best quality good to the consumers. The dairy industry is an excellent example of an industry that must locate near its market. Milk is very perishable and must be refridgerated in order to stay fresh, because of this dairy farms are located very near to the market in which their goods will be sold. Transportation costs are also diminished with dairies so close to their markets. Since cows today produce more milk than they did in the past, this increases the supply of milk that can be sold to the market and other industries that use milk as an input for other products, such as cheese.

(B) Bulk-reducing industries locate near their sites of raw materials. Iron ore, is a primary input in steel, therefore steel industries locate near the source of iron ore, in order to keep their transportation costs much lower. Since steel production is a bulk-reducing industry, the companies save a large sum of money locating near their raw material source, as iron ore is melted down to make steel and the final product is much more efficient to transport than the raw materials that weigh much more then the final product itself.

(C) Ethanol plants in the US, according to the map, are primarily located in the Mid West of the US. In states such as Nebraska, Minnesota, Iowa, Illinois and Wisconsin, corn is one of the primary crops produced. Since corn is one of the main

1

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inputs used to make ethanol, ethanol plants are logically located near their source of raw materials. By locating the plants in the areas where corn is a dominant crop, the plants cut down on their transportation costs as corn can be driven much easier from one county to another rather than from one side of the country to the other. According the Weberian theory, ethanol plant location in the Mid West is the closest the plants can get to their markets without beig being away from their raw materials. Locating in the Mid West makes it easier to distribute ethanol to both the east and west coasts with the least transportation costs as possible.

Question 1

Overview

This question was designed to enable students to show the degree to which they understood and were able to apply Weber's theory of industrial location. The question prompted them with the name of the theory's creator so answers did not depend on the student's remembering a specific individual's name. In addition to applying the theory to industries they knew something about, students were asked to apply the theory to the location of ethanol plants in the United States.

Sample: 1A
Score: 6

The essay demonstrates a comprehensive understanding of Weber's theory of industrial location and earned full credit. The response received 1 point in part A for correctly identifying the automobile industry as one that would locate near the market. An additional point was awarded for explaining that automobile production is a bulk-gaining industry that needs to reduce transportation costs by locating close to where its products are sold. The essay received 1 point in part B for correctly identifying the paper industry as one that should be located near raw materials. It gained an additional point for explaining that paper manufacturing is a bulk-reducing industry that loses considerable weight and volume in production and thus should be located near the source of raw materials. In part C the essay received 1 point for indicating that "ethanol is more cheaply transported than the corn used to make it." One additional point was awarded for explaining that ethanol is a bulk-losing industry that is profitable when located near the source of corn.

Sample: 1B
Score: 4

The essay received full credit in part A (2 points), full credit in part B (2 points) and no credit in part C. In part A it earned 1 point for correctly identifying the soft-drink industry as one that would locate near the market and 1 point for explaining that soda bottling is "a bulk gaining industry" that needs to be located near its point of sale in order to reduce transportation costs. In part B the essay was awarded 1 point for correctly identifying an "iron ore mill" as an enterprise that should locate near its raw materials and 1 point for explaining that iron ore extraction is "a bulk-reducing industry" in which the final product weighs much less than "the impure substance" and thus should be located near its natural resources in order to take advantage of the lowest possible transportation costs. The response received no credit in part C because the student never directly links corn with ethanol, nor is there a correct explanation of Weberian location principles.

Sample: 1C
Score: 3

The essay received no credit in part A, full credit in part B (2 points) and partial credit in part C (1 point). No points were awarded in part A because the discussion centers on the location and processing of primary agricultural products and not Weberian secondary industries. In part B the response earned 1 point for correctly identifying iron ore and steel producers as industries that would locate near their raw materials and 1 point for explaining that steel production reduces bulk and therefore processing should occur near the source of these materials in order to minimize the costs of transporting them. The essay received 1 point in part C for indicating that ethanol plants are located near the raw material (corn) in order to "cut down on their transportation costs." No additional point was awarded in this part, as the response does not correctly link its explanation of the plants' locations to Weber's theory (i.e., by mentioning the bulkiness of the raw material).