

Past-paper walk-through

Introduction to Sustainability ■ 5.12

eXercise

Questions in this set

- 2015 Q4

Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

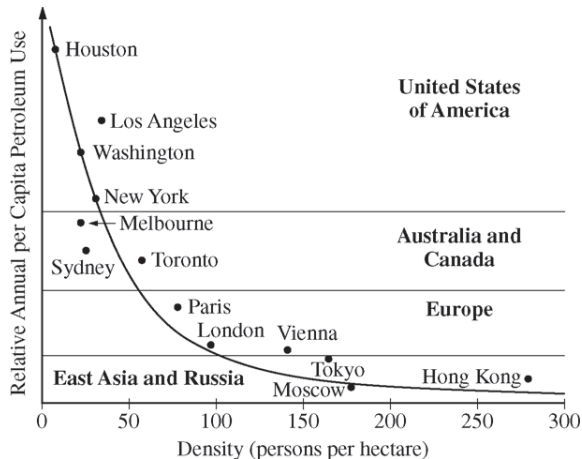
Question 4

2015 ■ Q4

The term “urban sprawl” describes the expansion of cities into rural areas. This phenomenon has occurred around the world and has had economic, health, and environmental consequences.

(a) Describe TWO causes of urban sprawl.

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(b) Discuss TWO human health effects associated with urban sprawl.

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The term “urban sprawl” describes the expansion of cities into rural areas. This phenomenon has occurred around the world and has had economic, health, and environmental consequences.

(c) The graph below shows the relationship between population density and petroleum use in selected cities. Describe the relationship between population density and petroleum use shown in the graph.

[Scatter/line graph titled with axes: y-axis “Relative Annual per Capita Petroleum Use” (unlabeled scale, decreasing curve), x-axis “Density (persons per hectare)” from 0 to 300 in increments of 50. A smooth downward-sloping curve passes near the plotted city points, showing petroleum use falling sharply as density rises then leveling off. Points, grouped by horizontal banding into four labeled regions from top to bottom (“United States of America”, “Australia and Canada”, “Europe”, “East Asia and Russia”):

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- Houston: very low density (~ 10), highest petroleum use, in “United States of America” band
- Los Angeles: low density (~ 25), high petroleum use, in “United States of America” band
- Washington: low density (~ 30), high petroleum use, in “United States of America” band
- New York: low-moderate density (~ 40), moderate-high petroleum use, in “United States of America” band
- Melbourne: density (~ 30), at top of “Australia and Canada” band
- Sydney: density (~ 25), in “Australia and Canada” band
- Toronto: density (~ 45), in “Australia and Canada” band
- Paris: density (~ 100), at top of “Europe” band

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- London: density (~ 100), in “Europe” band
- Vienna: density (~ 170), in “Europe” band
- Moscow: density (~ 180), at top of “East Asia and Russia” band
- Tokyo: density (~ 185), in “East Asia and Russia” band
- Hong Kong: density (~ 280), lowest petroleum use, in “East Asia and Russia” band]

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The term “urban sprawl” describes the expansion of cities into rural areas. This phenomenon has occurred around the world and has had economic, health, and environmental consequences.

(d) Smart growth focuses on ways to encourage sustainable urban development.

Describe TWO steps a municipality could take to encourage smart growth in order to limit urban sprawl.

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2015 ■ Q4

The term “urban sprawl” describes the expansion of cities into rural areas. This phenomenon has occurred around the world and has had economic, health, and environmental consequences.

(e) Highway systems and urban sprawl often threaten wildlife populations. Describe TWO methods to reduce harmful effects on wildlife populations from highways and urban sprawl.

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The term “urban sprawl” describes the expansion of cities into rural areas. This phenomenon has occurred around the world and has had economic, health, and environmental consequences.

(f) Urban sprawl often results in the loss of productive agricultural land near cities.

Describe one practical way to increase food production within urban areas.