

Week 22

AP Human Geography

Homework bundle for this week

本周作业合集

exercises.lol

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6. Cities and Urban Land-Use Patterns and Processes Starter Quiz · 课前小测

AP Human Geography

Name: _____ Score: _____

1. Urbanization is best defined as...
 - ☐ any city getting bigger
 - ☐ the rising share of people living in cities
 - ☐ building more farms
 - ☐ people leaving cities
2. A city with more than 10 million people is a...
 - ☐ suburb
 - ☐ megacity
 - ☐ hamlet
 - ☐ food desert
3. New York, London, and Tokyo are examples of...
 - ☐ informal settlements
 - ☐ world cities
 - ☐ food deserts
 - ☐ suburbs
4. The rule that the n th-largest city is $1/n$ the size of the largest is the...
 - ☐ primate rule
 - ☐ rank-size rule
 - ☐ bid-rent rule
 - ☐ gravity model
5. The urban model with several separate centres, not one CBD, is the...
 - ☐ concentric zone model
 - ☐ sector model
 - ☐ multiple nuclei model
 - ☐ bid-rent model
6. A city's site refers to its physical features, like a harbour or a hill.
 - ☐ True ☐ False

7. The fastest urban growth in the world today is in developing regions.
- ☐ True ☐ False
8. A city is a world city mainly because of its command of the global economy, not just its size.
- ☐ True ☐ False
9. A primate city is more than twice the size of the country's second city.
- ☐ True ☐ False
10. The sector model grows in wedges along transport routes.
- ☐ True ☐ False

AP Human Geography

1. **the rising share of people living in cities**

Urbanization = a rising *percentage* of people in cities.

2. **megacity**

A **megacity** exceeds 10 million people.

3. **world cities**

World cities command the global economy.

4. **rank-size rule**

The **rank-size rule** gives a smooth size distribution.

5. **multiple nuclei model**

The **multiple nuclei model** has several hubs.

6. **True**

Site = physical features; **situation** = relative location.

7. **True**

Asia, Africa, and Latin America lead urban growth today.

8. **True**

Finance, headquarters, and connections define a world city.

9. **True**

A **primate city** dominates, dwarfing all others.

10. **True**

Hoyt's **sector model** organises land into transport-aligned wedges.

6.1 The Origin and Influences of Urbanization

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS urbanization 城市化 • site 场地 • situation 位置

Objective

Build the skills to answer exam questions on **urbanization** 城市化 and its causes.

You must be able to:

- define **urbanization** 城市化
- distinguish a city's **site** 场地 from its **situation** 位置
- explain how transport and communication drive urban growth
- link industrialization to urbanization

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Urbanization

Urbanization is the growth in the share of people living in cities, driven by rural-to-urban migration and industrial jobs.

■ Site vs situation

Site is a city's physical setting (a river mouth, a hill). **Situation** is its position relative to other places (on trade routes, near resources).

■ Drivers of growth

Better **transport** and **communication** let cities grow and connect; industrial jobs pull migrants from the countryside.

2 Practice

2.1 Define urbanization. [2]

2.2 State the difference between a city's site and situation. [2]

2.3 A city grew where a river meets the sea, on a major trade route.

(a) Identify the site factor. [1]

(b) Identify the situation factor. [1]

3 Exam-style questions

3.1 The physical characteristics of the land a city is built on describe its [1]

- **A** situation
 - **B** site
 - **C** hinterland
 - **D** primacy
-

3.2 A major cause of rapid urbanization is [1]

- **A** fewer factory jobs
 - **B** rural-to-urban migration for industrial jobs
 - **C** falling transport links
 - **D** rising farm employment
-

3.3 Two towns have equal populations, but one sits at the crossing of two highways.

(a) Which factor gives that town an advantage — site or situation? [1]

(b) Explain how it aids growth. [1]

Solutions

2.1 the increase in the proportion of people living in urban areas/cities over time.

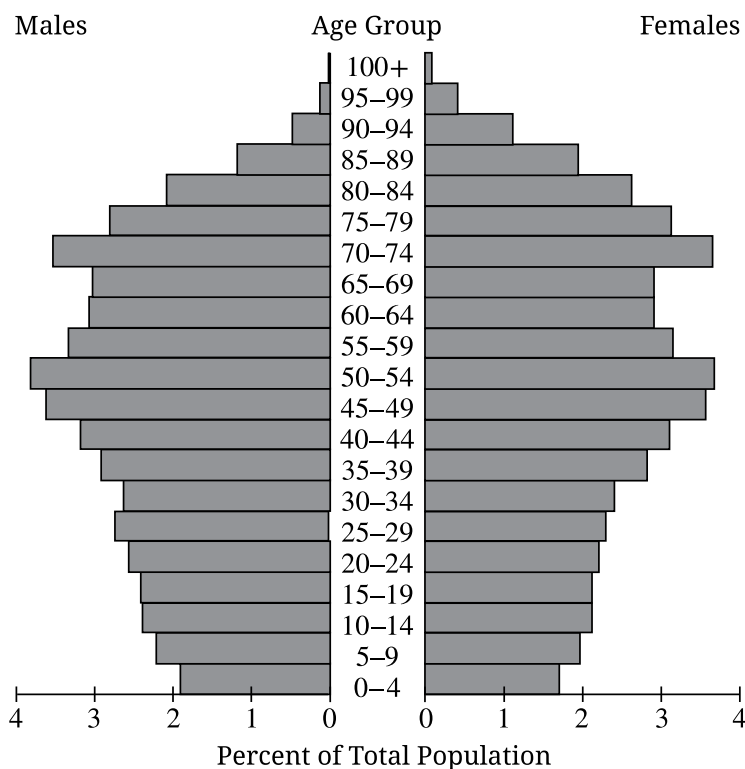
2.2 site = its physical characteristics/setting; situation = its location relative to other places.

2.3 (a) the river-mouth/coastal physical setting. (b) its position on a major trade route.

3.1 B. the physical setting of a city is its site.

3.2 B. industrial jobs pull migrants to cities, driving urbanization.

3.3 (a) situation. (b) good connections bring trade, jobs, and migrants, boosting growth.

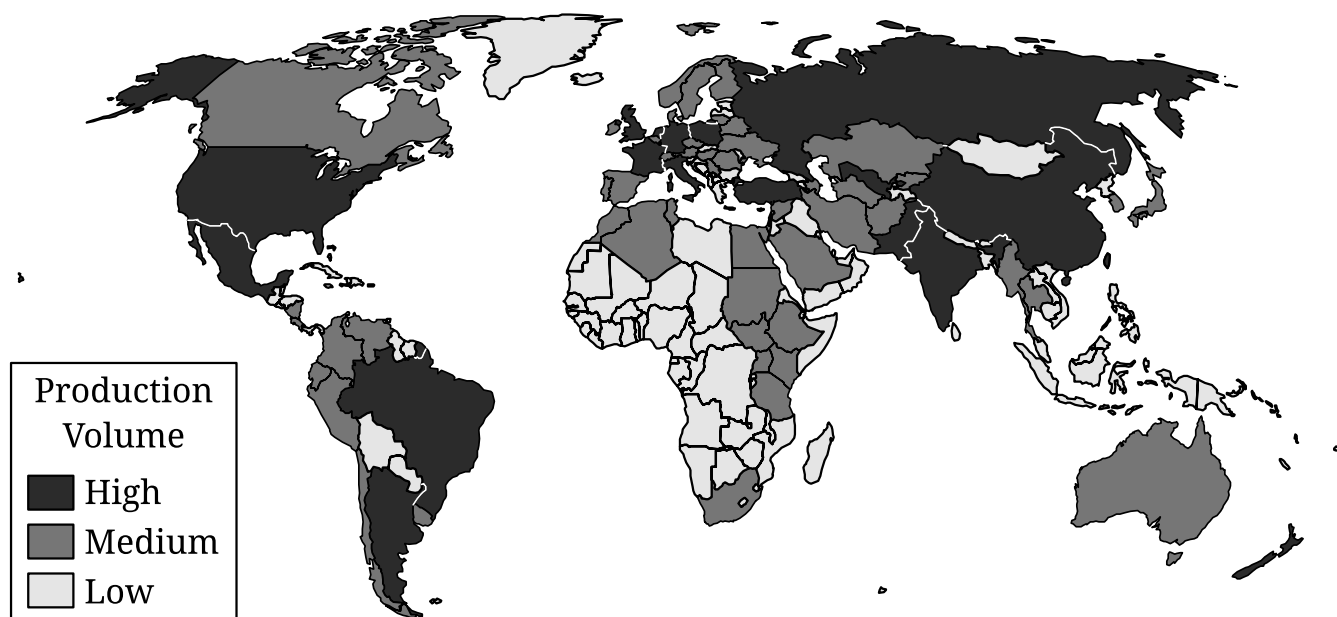
Japan Population Pyramid, 2021

Source: United States Census Bureau International Database

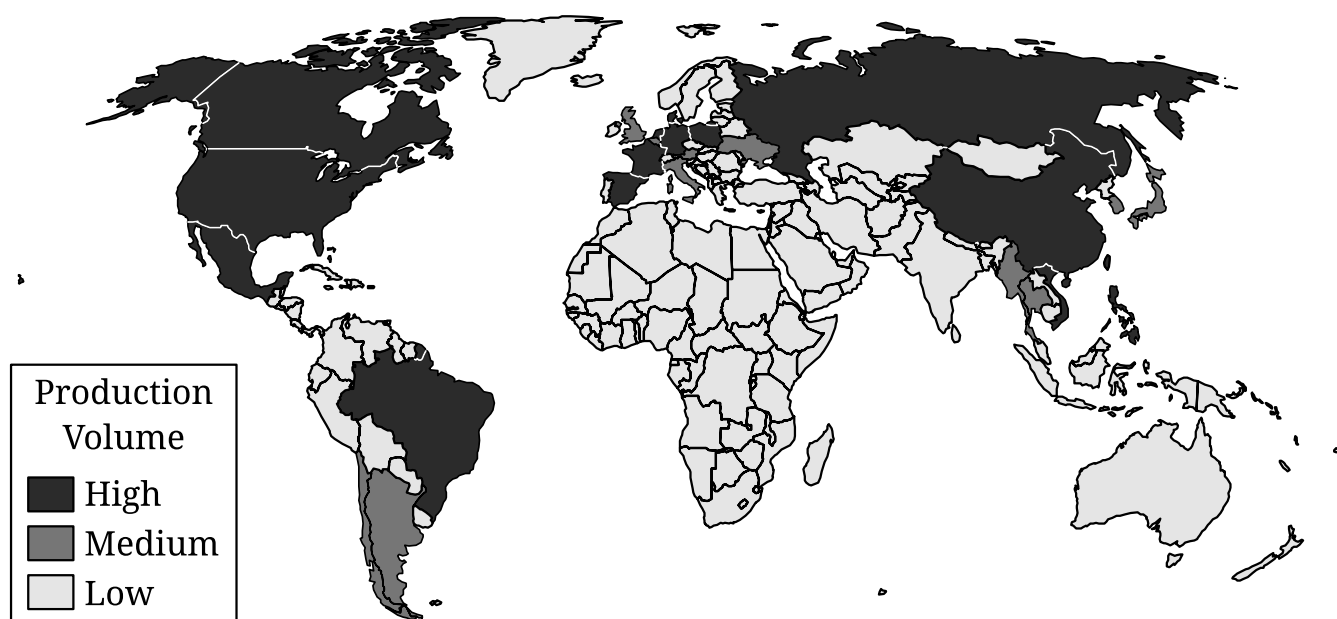
2. A population pyramid shows changes in population over time. A population pyramid breaks down the population by male and female and divides the population into five-year age groupings called cohorts.

Respond to parts A, B, C, D, E, F, and G.

- Identify the recent trend in fertility shown in the population pyramid.
- Based on the data shown in the population pyramid, describe the ratio of males to females in the Japanese population age 80 and above.
- Describe one process that drives urbanization.
- Describe one factor that may lead to a decrease in total population within a more developed country.
- Explain how a country's population pyramid can be used to predict the future needs of the population.
- Explain why the population pyramid provides limited information about immigration to cities in Japan.
- Explain the degree to which a country's population growth rate may be affected by a pronatalist policy. (Response must indicate the degree [low, moderate, high] and provide an explanation.)

Map 1: Cow's Milk Production, 2018

Source: Food and Agriculture Organization

Map 2: Pork Production, 2018

Source: Food and Agriculture Organization

6.2 Cities Across the World

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS megacity 特大城市 • world cities 世界城市 • site 地点

Objective

Build the skills to answer exam questions on **world cities** 世界城市 and megacities.

You must be able to:

- define a **megacity** 特大城市 (over 10 million)
- define a **world (global) city** 世界城市
- explain why world cities are command centres
- distinguish population size from global influence

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Megacities and metacities

A **megacity** has over 10 million people; a **metacity** over 20 million. These are defined by sheer **population size**.

■ World cities

A **world city** is a command centre of the global economy — hosting finance, corporate headquarters, and services that shape world affairs, regardless of raw population.

■ Size vs influence

A city can be huge but not a world city, or influential without being the largest — size and global power are different things.

2 Practice

2.1 Define a megacity. [2]

2.2 Explain why a world city has global influence. [2]

2.3 City A has 15 million people but little global business; City B has 8 million and hosts major banks and headquarters.

(a) Which is a megacity? [1]

(b) Which is more of a world city? Explain. [1]

3 Exam-style questions

3.1 A city is classified as a megacity based mainly on its [1]

- **A** global financial power
- **B** population size (over 10 million)
- **C** site
- **D** relict boundaries

3.2 A world city is best defined by its [1]

- **A** raw population
- **B** role as a command centre in the global economy
- **C** distance from the sea
- **D** carrying capacity

3.3 A finance hub of 9 million shapes global markets.

(a) Is it necessarily a megacity? Explain. [1]

(b) State what makes it a world city.

[1]

Solutions

2.1 an urban area with a population over 10 million people.

2.2 it is a command centre of finance/business/services; decisions there affect the global economy.

2.3 (a) City A (over 10 million). (b) City B — it is a command centre of the global economy despite being smaller.

3.1 B. a megacity is defined by population over 10 million.

3.2 B. world-city status comes from global economic command functions.

3.3 (a) no — under 10 million. (b) its command role in global finance/business.

6.3 Cities and Globalization

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS world cities 世界城市 • cities and globalization 城市与全球化

Objective

Build the skills to answer exam questions on **cities and globalization** 城市与全球化.

You must be able to:

- explain how world cities form an interconnected network
- describe world cities as command and control centres
- explain how globalization concentrates services in cities
- state one effect of this on the cities themselves

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ A network of world cities

World cities are linked in a **global network**, exchanging capital, information, and people — often more connected to each other than to their own hinterlands.

■ Command and control

They host corporate headquarters, banks, stock exchanges, and specialised services that direct the global economy.

■ Effects on the city

This concentration brings wealth and talent but also high living costs and sharp inequality between elite and low-wage workers.

2 Practice

2.1 Explain how world cities are interconnected. [2]

2.2 State two functions that make a city a global command centre. [2]

2.3 A world city attracts global banks and highly paid professionals.

(a) State one benefit to the city. [1]

(b) State one problem this can create. [1]

3 Exam-style questions

3.1 World cities are best understood as [1]

- **A** isolated from each other
- **B** nodes in an interconnected global network
- **C** purely agricultural
- **D** relict regions

3.2 Globalization tends to concentrate advanced financial services in [1]

- **A** remote villages
- **B** a few world cities
- **C** farming regions
- **D** polar areas

3.3 Two world cities on different continents share constant financial flows.

(a) What does this show about the global urban system? [1]

(b) Explain one social cost within such cities. [1]

Solutions

2.1 they exchange capital, information, and people in a global network, often tied to each other more than to their region.

2.2 any two of: corporate headquarters, finance/banking, stock exchange, specialised business services.

2.3 (a) wealth, jobs, investment, talent. (b) high living costs / inequality / unaffordable housing.

3.1 B. world cities form an interconnected global network.

3.2 B. globalization concentrates high-order services in world cities.

3.3 (a) it is a highly interconnected network of command centres. (b) sharp inequality / high cost of living for low-wage workers.

3. The world cities and metacities shown on the map are features of contemporary globalization and urbanization. The data table shows gross domestic product (GDP) per capita at the city and country scale.
- A. Identify ONE city on the map that is both a metacity and a world city.
 - B. Describe the spatial pattern of world cities shown on the map.
 - C. Compare the concept of a metacity with the concept of a world city. (Response must include both concepts in the comparison.)
 - D. Explain ONE reason why the cities shown on the table have higher city GDP per capita than the country GDP per capita.
 - E. Explain ONE way population growth in a metacity may challenge environmental sustainability.
 - F. Explain ONE reason why migrants to metacities may have difficulty obtaining housing.
 - G. Using the data from the table, explain the relationship between a city's level of economic development and the city's percent population growth over time.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

STOP

END OF EXAM

6.4 The Size and Distribution of Cities

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS rank-size rule 位序 • primate city 首位城市 • gravity model 引力模型 • central place theory 中心地理论
 • site 地点

Objective

Build the skills to answer exam questions on the **rank-size rule** 位序-规模法则 and city distribution.

You must be able to:

- state the **rank-size rule** 位序-规模法则
- define a **primate city** 首位城市
- outline **central place theory** 中心地理论
- explain the **gravity model** 引力模型

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Rank-size rule

The **rank-size rule** says the n th-largest city is about $1/n$ the size of the largest — the 2nd city $\approx 1/2$, the 3rd $\approx 1/3$, and so on.

■ Primate city

A **primate city** is far larger than all others (more than twice the second city) and dominates the country economically and culturally.

■ Central place & gravity

Central place theory explains the size and spacing of settlements by the services they provide. The **gravity model** predicts interaction as proportional to size and inversely to distance squared.

2 Practice

2.1 State the rank-size rule.

[2]

2.2 Define a primate city. [2]

2.3 A country's largest city has 8 million people; the next largest has 1 million.

(a) Does this fit the rank-size rule or primacy? Explain. [2]

3 Exam-style questions

3.1 If the largest city has 12 million people, the rank-size rule predicts the 3rd city has about [1]

- **A** 12 million
- **B** 6 million
- **C** 4 million
- **D** 1 million

3.2 The gravity model predicts that interaction between two cities increases with their size and decreases with [1]

- **A** their populations
- **B** the distance between them
- **C** their site
- **D** their toponyms

3.3 A capital dominates its country, dwarfing every other city.

(a) Name this pattern. [1]

(b) State one problem a primate city can cause. [1]

Solutions

2.1 the n th largest city is about $1/n$ the size of the largest; e.g. the 4th city $\approx 1/4$ of the largest.

2.2 a city more than twice the size of the next largest that dominates the country.

2.3 (a) primacy — the largest is far more than twice the second, not the ~ 4 million the rank-size rule predicts.

3.1 C. 3rd city $\approx 12\text{M} \div 3 = 4$ million.

3.2 B. interaction falls with distance (squared) in the gravity model.

3.3 (a) primate city / urban primacy. (b) uneven development — resources and jobs concentrate in one city, neglecting the rest.

3. The world cities and metacities shown on the map are features of contemporary globalization and urbanization. The data table shows gross domestic product (GDP) per capita at the city and country scale.
- A. Identify ONE city on the map that is both a metacity and a world city.
 - B. Describe the spatial pattern of world cities shown on the map.
 - C. Compare the concept of a metacity with the concept of a world city. (Response must include both concepts in the comparison.)
 - D. Explain ONE reason why the cities shown on the table have higher city GDP per capita than the country GDP per capita.
 - E. Explain ONE way population growth in a metacity may challenge environmental sustainability.
 - F. Explain ONE reason why migrants to metacities may have difficulty obtaining housing.
 - G. Using the data from the table, explain the relationship between a city's level of economic development and the city's percent population growth over time.

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STOP

END OF EXAM

6.5 The Internal Structure of Cities

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS concentric zone model 同心圆模型 • sector model 扇形模型 • multiple nuclei model 多核心模型
• central business district (cbd) 中央商务区 • urban models 城市模型

Objective

Build the skills to answer exam questions on **urban models** 城市模型 of internal structure.

You must be able to:

- describe the **concentric zone model** 同心圆模型
- describe the **sector model** 扇形模型
- describe the **multiple nuclei model** 多核心模型
- match a city description to a model

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Concentric zone model

The **concentric zone model** has rings around a central business district (CBD): a transition zone, then working-class, better housing, and commuter rings outward.

■ Sector model

The **sector model** shows land use in wedges radiating from the CBD along transport routes, so similar uses line up in strips.

■ Multiple nuclei model

The **multiple nuclei model** has several centres (nodes), not just one CBD — an airport, a university, an industrial park each anchor their own district.

2 Practice

2.1 Describe the concentric zone model. [2]

2.2 State how the sector model differs from the concentric zone model. [2]

2.3 A city has grown around several separate centres — a port, an airport, and a university district.

(a) Which model fits best? [1]

(b) Explain why. [1]

3 Exam-style questions

3.1 A model showing land use as wedges radiating out along transport lines is the [1]

- **A** concentric zone model
- **B** sector model
- **C** multiple nuclei model
- **D** gravity model

3.2 The concentric zone model is organized around a single [1]

- **A** airport
- **B** central business district
- **C** greenbelt
- **D** relict boundary

3.3 A modern city has many edge nodes rather than one dominant centre.

(a) Name the model that best describes it. [1]

(b) State one strength of this model over the concentric model.

[1]

Solutions

2.1 rings of land use around a central CBD, from transition/working-class to wealthier commuter zones outward.

2.2 the sector model uses wedges along transport routes instead of complete rings.

2.3 (a) the multiple nuclei model. (b) growth is anchored on several nodes, not a single CBD.

3.1 B. wedges along transport routes = sector model.

3.2 B. the concentric zone model centres on the CBD.

3.3 (a) multiple nuclei model. (b) it better fits modern cities with several centres and cars, not one CBD.

**SELECTED TECHNOLOGY RESEARCH AND DEVELOPMENT AREAS
IN THE MEDICAL FIELD**

Category	Product or Service
Biotechnology:	• Genetic engineering research • Biochemistry research • Diagnostic and testing science
Gene therapies:	• Cancer treatments • Neurological treatments • Rare and genetic disease treatments • Antiviral treatments and vaccines (e.g., Moderna)

3. Since the 1980s, the northeastern United States has developed into a major global center of high-technology industry that specializes in the medical field.
- Describe the spatial pattern of the companies and institutions shown in the inset map.
 - Describe the concept of a growth pole.
 - Explain ONE way education infrastructure affects a region's potential for high-technology development.
 - Explain how the pattern shown on the map resembles the galactic city model.
 - Explain ONE way local economic changes may be a result of deindustrialization.
 - Explain how the products and services listed in the table demonstrate that this economy has moved into the quaternary sector.
 - The map focuses on a regional scale. Explain a possible limitation of drawing country scale conclusions from a regional scale map.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

STOP

END OF EXAM

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6.6 Density and Land Use

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS land value 地价 • density 密度 • zoning 分区规划 • suburb 郊区

Objective

Build the skills to answer exam questions on urban **density** 密度, **land value** 地价, and zoning.

You must be able to:

- explain how **land value** 地价 falls with distance from the CBD (the bid-rent idea)
- link land value to building height and density
- define **zoning** 分区规划
- explain why residential density varies across a city

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Land value and the bid-rent curve

Land is most valuable at the CBD, where demand is highest, and cheaper farther out — the **bid-rent** idea. High land value pushes buildings **upward** (skyscrapers).

■ Density patterns

Density is highest near the centre (tall apartments) and lower in outer suburbs (detached houses on larger lots).

■ Zoning

Zoning laws set what can be built where — residential, commercial, or industrial — shaping the city's land-use pattern.

2 Practice

2.1 Explain why land near the CBD is the most expensive. [2]

2.2 Define zoning. [2]

2.3 A city has tall apartment blocks downtown and detached houses in the suburbs.

(a) Where is residential density higher? [1]

(b) Explain the link to land value. [1]

3 Exam-style questions

3.1 According to the bid-rent idea, land value is highest [1]

- **A** in the outer suburbs
- **B** at the central business district
- **C** on farmland
- **D** at a relict boundary

3.2 Laws separating a city into residential, commercial, and industrial areas are [1]

- **A** zoning
- **B** gerrymandering
- **C** devolution
- **D** redlining

3.3 Skyscrapers cluster in the city centre.

(a) Explain how land value causes this. [1]

(b) State how density changes toward the edge of the city. [1]

Solutions

2.1 it is the most accessible/central point; high demand drives up its value.

2.2 laws that divide a city into areas specifying the allowed land use (residential/commercial/industrial).

2.3 (a) downtown/near the CBD. (b) high land value forces tall, dense building to use costly land efficiently.

3.1 B. land value peaks at the accessible CBD.

3.2 A. land-use separation rules = zoning.

3.3 (a) expensive central land is used intensively by building upward. (b) density falls — larger lots and lower buildings.

2. The map shows political jurisdictions and Metrorail, a subway system in the Washington, D.C., metropolitan area. The city and county jurisdictions shown on the map operate the Washington Metropolitan Area Transit Authority (WMATA), which runs Metrorail.
- A. Identify ONE type of boundary shown on the map.
 - B. Describe ONE site characteristic of Washington, D.C., shown on the map.
 - C. Explain how political power is spatially distributed within a federal system of governance.
 - D. Explain ONE way suburban sprawl is likely to negatively affect environmental sustainability in metropolitan areas.
 - E. Describe ONE way transportation-oriented development, such as expanding a Metrorail line, may promote urban sustainability.
 - F. Explain how regional transportation networks led to the development of edge cities.
 - G. Explain how the geographic fragmentation of local governments could present a challenge to the Washington, D.C., metropolitan area's ability to construct a new Metrorail line.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

6.7 Infrastructure

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS infrastructure 基础设施 • suburb 郊区

Objective

Build the skills to answer exam questions on urban **infrastructure** 基础设施.

You must be able to:

- define **infrastructure** 基础设施
- give examples (transport, water, power, communication)
- explain how infrastructure shapes a city's growth and function
- link infrastructure to economic development

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Infrastructure

Infrastructure is the basic physical systems a city needs — roads, transit, water and sewers, power, and communication networks.

■ Shaping the city

Good infrastructure lets a city grow, move people and goods, and attract business; poor infrastructure limits growth and lowers quality of life.

■ Link to development

Investment in infrastructure supports economic development, connecting a city to markets and enabling new industry.

2 Practice

2.1 Define infrastructure and give two examples. [2]

2.2 Explain how good transport infrastructure helps a city grow. [2]

2.3 A fast-growing city cannot supply enough clean water and power.

(a) Name what the city lacks. [1]

(b) State one consequence for residents. [1]

3 Exam-style questions

3.1 Which is the best example of urban infrastructure? [1]

- **A** a person's opinion
- **B** a water and sewer network
- **C** a perceptual region
- **D** a toponym

3.2 Investment in infrastructure most directly promotes [1]

- **A** economic development
- **B** distance decay
- **C** primacy only
- **D** relict boundaries

3.3 A city builds a new metro line to its suburbs.

(a) State one way this shapes the city's growth. [1]

(b) Explain how it could attract business. [1]

Solutions

2.1 the basic physical systems supporting a city; e.g. roads, water/sewers, power, transit, communication.

2.2 it moves people and goods efficiently; this attracts business and lets the city expand.

2.3 (a) adequate infrastructure. (b) shortages, disease, unreliable power, or poor quality of life.

3.1 B. a water/sewer network is core infrastructure.

3.2 A. infrastructure supports economic development.

3.3 (a) suburbs along the line grow / people commute farther. (b) better access brings workers and customers, drawing firms.

1. Migration contributes to significant population growth and change in urban landscapes. As populations increase, urban areas face economic, social, and environmental challenges.

Respond to parts A, B, C, D, E, F, and G.

- A. Describe one type of voluntary migration.
- B. Explain how migration may affect a city's economy.
- C. Describe one type of housing discrimination that may occur in urban areas.
- D. Explain how a city's infrastructure affects society.
- E. Describe one challenge to sustainability in urban areas.
- F. Explain how urban design initiatives are intended to affect cities.
- G. Explain why urban design initiatives may be criticized.

2. The map shows political jurisdictions and Metrorail, a subway system in the Washington, D.C., metropolitan area. The city and county jurisdictions shown on the map operate the Washington Metropolitan Area Transit Authority (WMATA), which runs Metrorail.

- A. Identify ONE type of boundary shown on the map.
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Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

HUMAN GEOGRAPHY**SECTION II****Time—1 hour and 15 minutes****3 Questions**

Directions: You have 1 hour and 15 minutes to answer all three of the following questions. It is recommended that you spend approximately one-third of your time (25 minutes) on each question. It is suggested that you take up to 5 minutes of this time to plan and outline each answer. You may plan your answers in this orange booklet, but no credit will be given for anything written in this booklet. **You will only earn credit for what you write in the separate Free Response booklet.**

Question 1

1. Political geographers analyze territoriality and sovereignty at a variety of scales, including regional, state, substate regional, and local.
 - A. Define the concept of territoriality in terms of political geography.
 - B. Describe the concept of sovereignty as it relates to the state.
 - C. Compare ONE difference in territorial organization between the governments of unitary states and the governments of federal states.
 - D. Recently, the United Kingdom decided to withdraw from the European Union. Explain ONE possible reason why sovereignty would play a role in the United Kingdom's decision to withdraw from the European Union.
 - E. During the United Kingdom's withdrawal from the European Union, some people in Scotland proposed independence from the United Kingdom. Explain ONE possible reason why territoriality would play a role in the devolution of a state.
 - F. Local governments often divide cities into representative electoral districts. Explain how the process of redrawing district boundary lines may affect election results within a city.
 - G. Explain why neighboring local governments may face challenges in providing transportation services to residents of a rapidly growing metropolitan area.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

6.8 Urban Sustainability

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS greenbelt 绿化带 • mixed-use development 混合用途开发 • smart growth 精明增长 • urban sustainability 城市可持续性
• greenbelts 绿带

Objective

Build the skills to answer exam questions on **urban sustainability** 城市可持续性.

You must be able to:

- define **smart growth** 精明增长
- explain **mixed-use development** 混合用途开发
- define a **greenbelt** 绿化带
- state one aim of sustainable urban design

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Sustainable urban design

Sustainable cities aim to grow while cutting pollution, sprawl, and resource use — through compact building, transit, and green space.

■ Smart growth and mixed-use

Smart growth concentrates development to limit sprawl. **Mixed-use development** puts homes, shops, and offices together so people can walk instead of drive.

■ Greenbelts

A **greenbelt** is a ring of protected open land around a city that limits sprawl and preserves nature.

2 Practice

2.1 Define smart growth. [2]

2.2 Explain how mixed-use development reduces car use. [2]

2.3 A city protects a ring of farmland and forest around its edge.

(a) Name this feature. [1]

(b) State one benefit it provides. [1]

3 Exam-style questions

3.1 A ring of protected open land that limits a city's outward growth is a [1]

- **A** greenbelt
- **B** CBD
- **C** shatterbelt
- **D** relict boundary

3.2 Mixed-use development mainly aims to [1]

- **A** increase driving
- **B** let people live, work, and shop close together
- **C** expand sprawl
- **D** raise land value only

3.3 A city adopts smart-growth policies.

(a) State one problem it is trying to solve. [1]

(b) Explain how compact development helps sustainability. [1]

Solutions

2.1 urban planning that concentrates development to limit sprawl and use land/resources efficiently.

2.2 homes, shops, and workplaces are close together; people can walk or cycle instead of driving.

2.3 (a) a greenbelt. (b) it limits sprawl / preserves nature / provides recreation.

3.1 A. protected land ringing a city = greenbelt.

3.2 B. mixed-use puts uses together to cut travel/driving.

3.3 (a) urban sprawl / car dependence / resource waste. (b) it uses less land and energy and supports transit, cutting emissions.

- 1.** Migration contributes to significant population growth and change in urban landscapes. As populations increase, urban areas face economic, social, and environmental challenges.

Respond to parts A, B, C, D, E, F, and G.

- A.** Describe one type of voluntary migration.
- B.** Explain how migration may affect a city's economy.
- C.** Describe one type of housing discrimination that may occur in urban areas.
- D.** Explain how a city's infrastructure affects society.
- E.** Describe one challenge to sustainability in urban areas.
- F.** Explain how urban design initiatives are intended to affect cities.
- G.** Explain why urban design initiatives may be criticized.

6.9 Urban Data

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS urban data 城市数据 • quantitative 定量 • qualitative 定性 • informal settlements 非正规住区

Objective

Build the skills to answer exam questions on **urban data** 城市数据.

You must be able to:

- distinguish **quantitative** 定量 from **qualitative** 定性 urban data
- name sources of urban data (census, surveys, remote sensing)
- explain how data guides urban planning
- state one limitation of urban data

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Types and sources

Urban planners use **quantitative** data (census counts, traffic numbers) and **qualitative** data (resident interviews, field observation).

■ Using data

Data reveals where people live, commute, and lack services, guiding decisions on housing, transit, and investment.

■ Limitations

Data can be out of date, incomplete, or miss informal settlements and marginalised groups.

2 Practice

2.1 State one source of quantitative urban data and one of qualitative. [2]

2.2 Explain how urban data guides planning. [2]

2.3 A city uses a census plus interviews to plan a new district.

(a) State what the census provides. [1]

(b) State what the interviews add. [1]

3 Exam-style questions

3.1 A city census provides mainly [1]

- **A** qualitative opinions
- **B** quantitative population data
- **C** map projections
- **D** toponyms

3.2 One limitation of urban data is that it may [1]

- **A** always be perfect
- **B** miss informal settlements and marginalised groups
- **C** replace all planning
- **D** never change

3.3 Planners combine satellite imagery with resident surveys.

(a) State one advantage of using both data types. [1]

(b) State one limitation they should watch for. [1]

Solutions

2.1 quantitative: census/traffic counts; qualitative: resident interviews/field observation.

2.2 it shows where people live, move, and lack services; planners target housing, transit, and investment accordingly.

2.3 (a) numerical counts of population/housing. (b) residents' needs, opinions, and experiences.

3.1 B. a census gives quantitative population data.

3.2 B. data can miss informal/marginalised populations.

3.3 (a) numbers plus lived experience give a fuller, more accurate picture. (b) data may be outdated or miss some groups.

6.10 Challenges of Urban Changes

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS gentrification 士绅化 • urban sprawl 城市蔓延 • suburbanization 郊区化 • urban renewal 城市更新
• residential segregation 居住隔离

Objective

Build the skills to answer exam questions on **challenges of urban change** 城市变化的挑战.

You must be able to:

- define **suburbanization** 郊区化 and **urban sprawl** 城市蔓延
- define **gentrification** 士绅化 and state one effect
- explain **residential segregation** 居住隔离
- explain **urban renewal** 城市更新

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Suburbanization and sprawl

Suburbanization is the movement of people and business to the edges of a city. Uncontrolled, low-density spreading is **urban sprawl**, which eats farmland and increases driving.

■ Gentrification

Gentrification is the renovation of a poorer inner-city area, raising property values — improving buildings but often displacing longtime, lower-income residents.

■ Segregation and renewal

Residential segregation separates groups by income or ethnicity across neighbourhoods. **Urban renewal** rebuilds run-down areas, which can help or displace residents.

2 Practice

2.1 Define urban sprawl and state one problem it causes.

[2]

2.2 Explain one negative effect of gentrification. [2]

2.3 A run-down inner-city area is renovated and becomes fashionable and expensive.

(a) Name this process. [1]

(b) State who may be forced to move. [1]

3 Exam-style questions

3.1 The low-density, uncontrolled spread of a city into surrounding land is [1]

- **A** gentrification
- **B** urban sprawl
- **C** smart growth
- **D** urban renewal

3.2 Renovating a poor neighbourhood so property values rise and original residents leave is [1]

- **A** suburbanization
- **B** gentrification
- **C** segregation
- **D** zoning

3.3 Wealthier families move to the edge of a city, leaving the inner core poorer.

(a) Name this movement. [1]

(b) Explain how it can worsen segregation. [1]

Solutions

2.1 low-density, uncontrolled outward spread of a city; it consumes farmland / increases car dependence and pollution.

2.2 rising rents/property values displace longtime lower-income residents.

2.3 (a) gentrification. (b) longtime lower-income residents priced out.

3.1 B. uncontrolled outward spread = urban sprawl.

3.2 B. upgrading that displaces the poor = gentrification.

3.3 (a) suburbanization. (b) it separates richer suburbs from a poorer inner city, deepening income/ethnic segregation.

1. Migration contributes to significant population growth and change in urban landscapes. As populations increase, urban areas face economic, social, and environmental challenges.

Respond to parts A, B, C, D, E, F, and G.

- A. Describe one type of voluntary migration.
- B. Explain how migration may affect a city's economy.
- C. Describe one type of housing discrimination that may occur in urban areas.
- D. Explain how a city's infrastructure affects society.
- E. Describe one challenge to sustainability in urban areas.
- F. Explain how urban design initiatives are intended to affect cities.
- G. Explain why urban design initiatives may be criticized.

3. The world cities and metacities shown on the map are features of contemporary globalization and urbanization. The data table shows gross domestic product (GDP) per capita at the city and country scale.

- A. Identify ONE city on the map that is both a metacity and a world city.
- B. Describe the spatial pattern of world cities shown on the map.
- C. Compare the concept of a metacity with the concept of a world city. (Response must include both concepts in the comparison.)
- D. Explain ONE reason why the cities shown on the table have higher city GDP per capita than the country GDP per capita.
- E. Explain ONE way population growth in a metacity may challenge environmental sustainability.
- F. Explain ONE reason why migrants to metacities may have difficulty obtaining housing.
- G. Using the data from the table, explain the relationship between a city's level of economic development and the city's percent population growth over time.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

STOP

END OF EXAM

6.11 Challenges of Urban Sustainability

Name: _____ Class: _____ Date: _____

Total: 10 marks

KEY WORDS challenges of urban sustainability 城市可持续性的挑战 • climate change 气候变化 • sprawl 城市蔓延
• informal settlements 非正规住区

Objective

Build the skills to answer exam questions on **challenges of urban sustainability** 城市可持续性的挑战.

You must be able to:

- explain how sprawl harms sustainability
- explain sanitation and housing-affordability challenges
- link cities to **climate change** 气候变化
- state one sustainable solution

1 Worked examples

Study these first. Each one shows the method for a task used later.

■ Sprawl and services

Sprawl raises car use, emissions, and the cost of extending water, power, and transit, while covering farmland and habitat.

■ Sanitation and housing

Fast-growing cities can struggle to supply clean water and **sanitation**, and rising demand makes **housing** unaffordable, forcing informal settlements.

■ Climate and solutions

Cities produce most greenhouse-gas emissions. Solutions include public transit, green building, denser smart growth, and affordable housing.

2 Practice

2.1 Explain how urban sprawl harms sustainability. [2]

2.2 State two challenges a fast-growing city faces in providing for residents. [2]

2.3 A booming city has spreading informal settlements without proper sanitation.

(a) State one health risk this creates. [1]

(b) State one sustainable response. [1]

3 Exam-style questions

3.1 A major sustainability problem caused by urban sprawl is [1]

- **A** less driving
- **B** higher car use and emissions
- **C** cheaper services
- **D** protected farmland

3.2 A sustainable response to unaffordable city housing is to [1]

- **A** ban all building
- **B** build affordable, denser housing near transit
- **C** expand low-density sprawl
- **D** remove sanitation

3.3 Cities produce most of the world's greenhouse-gas emissions.

(a) State one reason cities emit so much. [1]

(b) State one policy to cut a city's emissions. [1]

Solutions

2.1 it increases driving/emissions and the cost of services; it consumes farmland and habitat.

2.2 any two of: clean water/sanitation, affordable housing, transit, waste, power.

2.3 (a) spread of disease from poor water/sanitation. (b) invest in water/sanitation, affordable formal housing, upgrading.

3.1 B. sprawl increases driving and emissions.

3.2 B. affordable dense housing near transit is a sustainable fix.

3.3 (a) concentrated transport, energy use, industry, and buildings. (b) public transit, green buildings, renewable energy, smart growth.

1. Migration contributes to significant population growth and change in urban landscapes. As populations increase, urban areas face economic, social, and environmental challenges.

Respond to parts A, B, C, D, E, F, and G.

- A. Describe one type of voluntary migration.
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STOP

END OF EXAM

