13rd Hungarian Geographical Contest 2021/22

2nd Round

Written Test

Question and Answer Booklet

12 February, 2022

Password: .....

Date of birth: .....

PW:

Instructions for Students

1. Fill in your password and your date of birth on the front page of this Question and Answer Booklet (QAB) and also on the top of all pages.

2. The test consists of 6 sections, marked with letter A-F. You can find all the sources (maps, figures, photos and tables) referred to in the Source Booklet (SB).

3. You can earn a total of **124 points.** Each section has a different maximum value:

A	20
B	22
C	12
D	26
E	18
F	26

4. All questions should be answered in the spaces provided in this booklet. Only answers given in QAB will be accepted: any answers written in the (SB) will be ignored. The backsides of the papers are available for notes and calculations, but NOT for answers.

5. Only the required number of answers (reasons, examples etc.) will be accepted in the order they are written. For instance, if the question asks for 2 reasons and you give more than 2, only the first 2 reasons will be marked.

6. Where appropriate, write sentences or phrases, not single words.

7. You might need a calculator, a ruler and pencils during the test.

8. You have a total of 180 minutes to answer all questions.

Good luck!

PW:

*Section A - Shocking experience in the neighbourhood **[20]***

A series of earthquake in the region of Petrinja

On 29th December 2020, a significant earthquake hit the town of Petrinja, Croatia – tremors were clearly observable even in Hungary.

A.1.1. Study the tectonic map (A.1.) in the Source booklet (SB). What can be the reason of these seismic events in Croatia? Based on the tectonic map the area of interest, describe in 4-5 sentences what could have shaken up the life of the local residents. The red star indicates the epicentre of the earthquake on 29th December 2020 in Petrinja (it was the so-called main shock). **[2]**

A.1.2. Name three other European regions with high tectonic risk! **[3]**

A.1.2.1.

A.1.2.2.

A.1.2.3.

A.2. How can we characterise the damages and impacts related to an earthquake? Study the map A.2. in the SB and answer the questions.

A.2.1. How large was the intensity in and in the immediate vicinity of the epicentre (epicentral intensity)? **[1]**

A.2.2. What methods are used to investigate and map seismic activities? **[1]**

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A.2.3. Earthquakes are often observed even at great distances from the epicentres. In addition to distance, name two factors that may influence the impacts and personal perceptions of earthquakes! **[2]**

A.2.3.1

A.2.3.2.

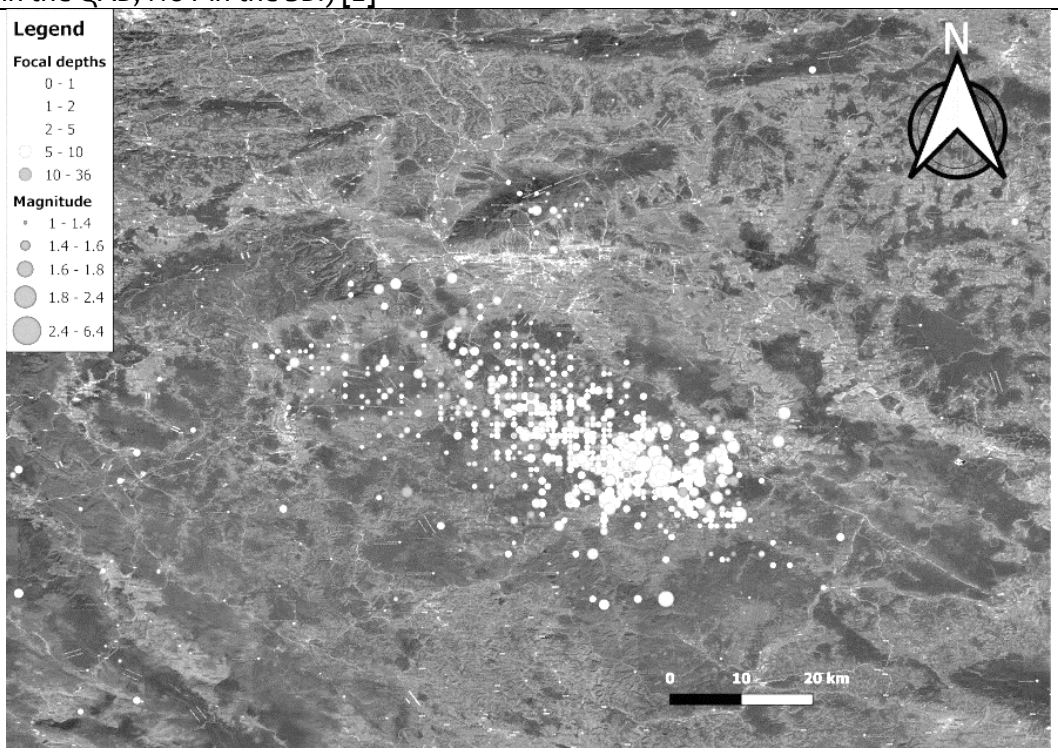
A.3. On map A.3. of the SB, the epicentres of the seismic activities are shown between 29 December 2020 and 14 November 2021. Answer the following questions based on this map. Colours show the focal depths (hypocentres) whereas the size of the circles is proportional to the magnitude.

A.3.1. What does magnitude mean? **[1]**

A.3.2. Which scale is often used to describe the energy of an earthquake? **[1]**

A.3.3. This scale is logarithmic i.e., an earthquake described as "5" is .... times more powerful than one which has a magnitude of 4. **[1]**

A.3.4. Based on the spatial distribution of the seismic events, draw a fault line which is likely responsible for the occurrence of the observed seismic events. (Draw the line on the map below, here in the QAB, NOT in the SB!) **[2]**



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A.4. Nowadays, satellites are also capable to "see" earthquakes and monitor motions and deformations. With their help, the tectonic settings can be interpreted in a more comprehensive way.

On figure A.4. of SB, an interferogram, derived from a Sentinel-1 image, shows the location of the main shock. In the legend LOS stands for line-of-sight.

Are the following statements true or false? **[6]**

Statement	True	False
A-B probably represents the main fault line		
According to calculations, the earthquake had a magnitude of 8		
Areas southwest of the city of Sisak have moved towards the epicentre by more than 20 cm by the earthquake		
In the blue areas elevation increased by up to 30 cm		
The main fault line has a direction of NW to SE		
In Petrinja, different districts or even streets of the town might have moved in opposite direction		

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Section B - Climate change and answers from all over the world **[22]**

Climate is changing, has changed and will change even after the disappearance of humans. The question is whether climate change will put an end on human life? Is this change, at least partly, caused by us? The answer is so simple, yet so complex.

The United Nations Framework Convention on Climate Change (UNFCCC) established an international environmental treaty to combat "dangerous human interference with the climate system", in part by stabilizing greenhouse gas (GHG) concentrations in the atmosphere.

B.1. Take a look at the pictures of four cities around the world being far different in many aspects, but somehow related to each other (B.1. in SB)

B.1.1. Name the cities plotted in the pictures and give the connection point **[3]**
Location 1.
Location 2.
Location 3.
Location 4.
Connection point

B.2. You can see the main focuses of the Kyoto Protocol (B.2.1.) and the Paris Agreement (B.2.2.) in SB.

B.2.1. What were the main foci of the two meetings? How those above connect to the UNFCCC? Answer in 3-4 sentences. **[3]**

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B.2.2. Give three examples of GHGs thought to be responsible for climate change. What are the major anthropogenic sources of the increasing GHG levels? **[6]**

B2.2.1. example

source

B2.2.2. example

source

B2.2.3. example

source

B.3. There are many different "policies" to combat climate change. There are two main problem-solving techniques in the focus of the researchers and also policy makers.

Adaptation: ~ refers to adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects or impacts. It refers to changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change.

Mitigation: ~ refers to efforts reducing or preventing the emission of GHGs. Mitigation means using new technologies and renewable energies, making older equipment more energy efficient, or changing management practices or consumer behaviour.

B.3.1. See the following statements and decide whether they are related to adaptation, mitigation or both. **[6]**

List of statements:

1. Change in land use, relocation
2. Energy conservation and efficiency
3. Renewable energy
4. Green infrastructure
5. Upgrades or hardening of building and infrastructure
6. Water and energy conservation
7. Smart growth
8. Emergency and business continuity planning
9. Residential programs promoting adaptation
10. Carbon sinks
11. Sustainable transportation, improved fuel efficiency
12. Health programs capturing and utilizing landfill and digester gas

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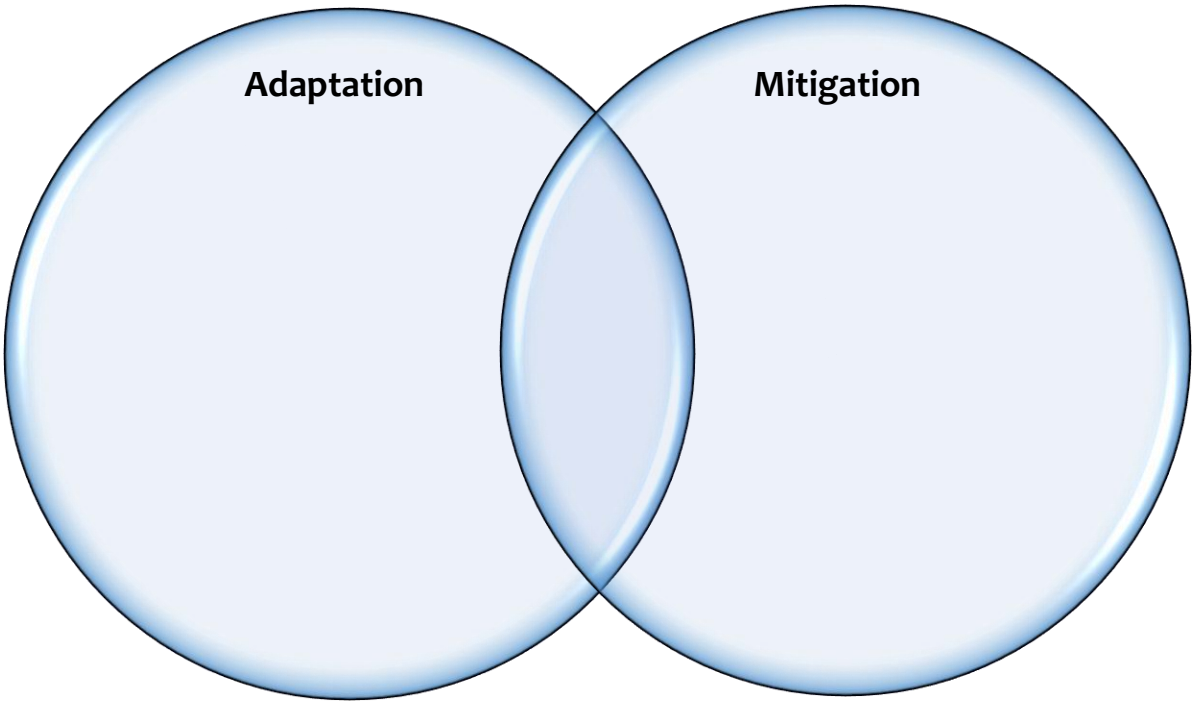

B.4. Study figures B.3. in SB! Some of the most famous mitigation programs are focusing on creating "green walls" by planting trees to stop desertification processes, with some success.

B.4.1. Give three positive effects of these tree-planting programs! **[2]**

B.4.2. Name two geographical regions (not countries) where these programs could be important! **[1]**

B.4.3. We hardly refer in this competition to Hungarian contents, but could you name a similar (and mainly successful) intervention to the landscape from the history of Hungary? **[1]**

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*Section C – Biogeography of the Canary Islands **[12]***

This exercise examines the Canary Islands from a botanical (although geography-driven) aspect. Your task is to answer the questions, analyse patterns and react to unfolding environmental problems.

C.1.1. Based on your knowledge and the sources (C.1.1. in SB), describe the main climatic characteristics of the Canary Islands in 2–3 sentences! **[2]**

C.1.2.1. Which vegetation zone(s) is/are found only in Tenerife among the islands of the Canarian Archipelago? **[1]**

C.1.2.2. What is the reason for that? **[1]**

C.2. *Fig. C.1. shows a detailed sketch of the Teide National Park with the Las Cañadas caldera system. This area is known for its unique flora, especially the endemic species of Tenerife bugloss (Echium wildpretii*[1]*, populations are shown in black, numbered dots). This plant is also called the 'tower of jewels', after its majestic appearance.*

C.2.1. How will climate change likely effect the habitat of this endemic plant? Explain it in 2–3 complex sentences! **[3]**

[1] This plant has no official English, nor Hungarian name. The approximate Hungarian translation is Tenerifei kígyószisz.

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There is another interesting phenomenon on the island of Tenerife when it comes to botany. The prevailing trade winds create a contrast between the humid (windward) slopes and the arid (leeward, rain shadow) slopes. The main climatic feature is the orographic cloud layer caused by temperature and humidity inversions on the windward slopes at altitudes of up to ca. 1,200 m a.s.l. Natural vegetation is structured altitudinally from coast to summit in five main vegetation belts, namely coastal scrub, thermophilic scrub, laurel forest (chiefly at the windward slope), Pinus canariensis (Canary pine) forests and summit or high mountain shrubs.

C.2.2. Based on all of the sources in section C in the SB, draw a schematic cross section of the orographic–botanical-vegetational pattern of Tenerife! Mark the prevailing wind, proper orientation, and the main vegetation types. **[5]**

Draw your sketch here!

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Section D – Silk road to the savanna ***[26]***

The economic expansion of China has become one of the most important trends of world economy in the last decade. Although the concept of the "new silk road" landbridge to Europe is better known in Hungary, Africa has also been in the focus of Chinese investment activities recently.

D.1.1. Study the data of table D.1.1. in SB! There are selected countries of Sub-Saharan Africa with data explaining their trading relations towards China. As you see, there are significant differences in their relations.

D.1.1.1. Classify the countries and write their names to the proper place in the following table! **[4]**

		Trade balance in relation to China	
		negative	positive
Importance of Chinese trade	high	A	B
	low	C	D

D.1.1.2. What common characteristics can you list concerning… **[3]**

… countries in group A?
… countries in group B?
… countries in group C and D?

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D.2.1. Look at table D.2. of SB! Draw a chart (here) and depict the connection between economic growth and FDI inflow! Take care of the usual formal elements of a chart! **[5]**

D.2.2. Look at the chart created!

D.2.2.1. According to the data, which country has the strongest correlation between investment and economic growth? **[1]**
D.2.2.2. What could be the main reason of Chinese investments in this country? **[1]**
D.2.2.3. In one country, a quite low level of investments is combined with intensive growth. What could be the reason of the high growth rate of this country? Give two possible factors! **[2]**
a.
b.

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D.2.2.4. Another, major country has the lowest average growth rate in this period.
a. This country is often referred as a member of a group of emerging economies, labelled by an acronym. Give this acronym! **[1]**
Being long time the most developed and only industrialised country in Sub-Saharan Africa, this country was a forerunner of modernisation in the continent. However, recently its structural problems have been revealed. Give two structural weaknesses of the local economy. **[2]**
b.
c.

D.3. Read the text D.3. in SB and answer the following questions!

D.3.1. Which are the motivations (hoped benefits) of these investments of both side? Give 3-3 items! **[3]**	
African countries	China
D.3.2. Chinese investments in Africa have changed with time – how? **[1]**	
D.3.3. The text is focusing on mainly the risks of these investments. Give three items of these risks! **[3]**	
a.	
b.	
c.	

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*Section E – General elections in Ohax **[18]***

In this exercise you will explore the electoral geography of a fantasy country, Ohax. In addition to defining the spatiality of certain parties, electoral geography also examines the role of the geographical environment and context in addition to the variables derived from individual factors (e.g., education, unemployment) behind the spatially varying results of those parties. Electoral geography also deals with the problems of the territorial framework of elections (e.g., constituencies, electoral districts) and makes proposals to the legislature for its perfect and fair design.

E.1. Election results and "human" geography

In the first exercise, you will analyse the 2021 Ohaxish parliamentary election based on the results in the provinces (provinces correspond to the electoral district level in this case). The first researchers in electoral geography compared the results of each party with maps of physical and human geographic variables and drew conclusions. Working with such aggregate factors (e.g., unemployment in an area), usually derived from censuses, is also an important method of electoral geography today (now, of course, with much more modern analytical facilities). Such analyses, however, need to pay attention to several things. Firstly, the general characteristics of a group cannot be used to draw firm conclusions about the individuals who make up that group, for example, even if the result at national level show that the unemployment rate is correlated with the electoral result of the Social Democratic Party, it cannot be said that all unemployed people vote for the Social Democratic Party. On the one hand, this is influenced by other possible individual variables, it may be that a voter's religious affiliation is more important than the fact that he or she is unemployed and therefore votes for a religious party. Finally, the geographical context and neighbourhood may also influence and locally modify the national trend.

Table 1 in SB shows the results of the parties contesting the elections by province. Use the maps E.1. to E.5. in SB and the characteristics of the parties' voters to identify the parties. **[10]**

Name	Description	Letter from table E.1. in SB
Orcish Green Party	The party's supporters espouse liberal values in addition to advocating the emergence of green energy, and this party has the highest proportion of voters with tertiary education	
Social Democrats	The party is particularly popular among workers in the mining and heavy industry sectors. In provinces where the party is popular, the ethnic factor is only a secondary factor in party choice	
Elvish Freedom Party	The ethnic party of the Elvish minority. The party's support tends to correlate well with the proportion of the Elvish minority	
Moderates – The Orcish National Conservative Party	They support the traditional family model and restrictions on the admission of refugees from neighbouring countries. Few Elves now reside in the party's main support areas	
Agrarian Party	The party's support is related to the extent to which the land is arable and the quality of the soil. As a result, the party's stronghold area is dominated by agriculture over other economic sectors	

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E.2.

As you have observed in the previous exercise, some provinces did not match the national pattern and the results did not follow the main characteristics of party supporters. These discrepancies are caused by the context effect. Indeed, individual voter behaviour cannot be satisfactorily explained without placing individuals in the socio-geographic context of their lives. In what follows, we look for provinces where the winning party's performance was larger than expected relative to the overall national trends.

E.2.1. Complete the table by adding the name of one province to each description. Use Tables of results and all maps of section E in SB! **[5]**

Description	Name of the province
The province lies along the border. The neighbouring municipality of Eigreth, on the other side of the border, is a stronghold of social democracy, and as most of the inhabitants of the province in question commute to Eigreth, they are strongly influenced by this ideology. This is what led to the surprise victory of the Social Democrats.	
The province is ethnically divided between Orcs and Elves. In such ethnically polarised areas, the ethnic parties are even stronger. The Elvish party took advantage of this and mobilised well, and as some of the Orcs did not turn out to vote, they won the province.	
In the province, the Green Party has openly backed the agrarian party and assured the agrarian candidate of its support.	
In addition to a highly educated population, environmental concerns about a local mine are boosting the party's support.	
In this province, the Moderate Party won, even with a less conservative and more highly educated population. The reason is that the party's local candidate is particularly popular and has been the province's MP for 12 years.	

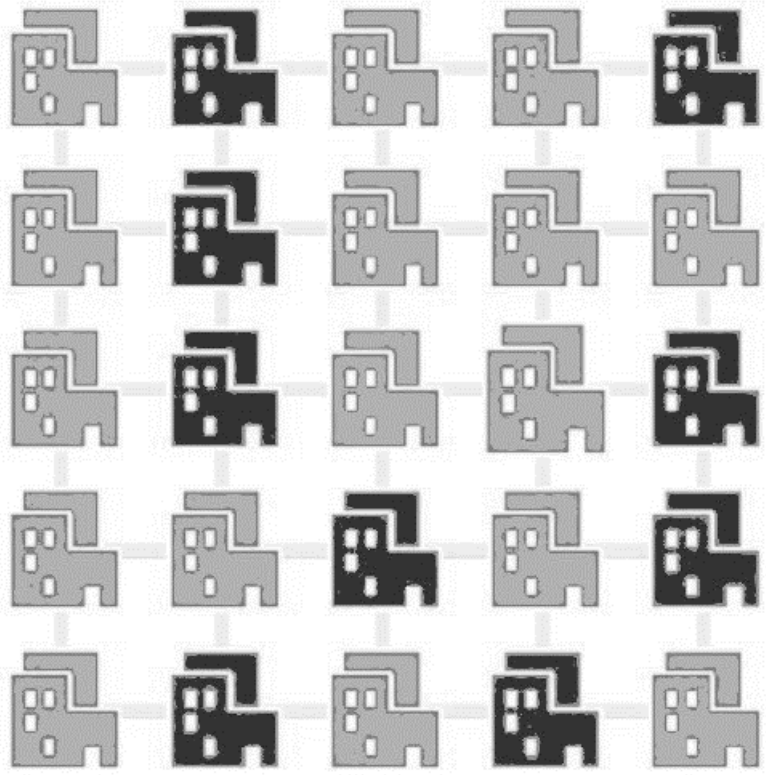
E.3. Creating strange "regions"

In representative democracies, Gerrymandering refers to political manipulation of electoral district boundaries with the intent of creating undue advantage for a party, group, or socio-economic class within the constituency. One of the principal techniques of gerrymandering is malapportionment, or the unequal distribution of electors among constituencies. The ,,original" gerrymandering is much more noticeable compared to malapportionment, thanks to the geographic shape of constituencies. That is, a district is often termed a gerrymander because it has a strange or "bizarre" shape, or its shape itself is taken as evidence that the boundaries have been "unfairly" manipulated. One method of gerrymandering is cracking, whereby the main supporting areas of a minor party are allocated to the larger party's support are in such a way that the larger party has a majority and wins them. If a

party's support area is too large and concentrated, it is advisable to pack that coverage into a single constituency, where the party will gain a supermajority (packing). The other areas can then be won by the other party almost unopposed. Sample E.6. of SB shows how it is possible to ensure that the party with the smaller territorial support wins the election with two constituencies against one.

E.3.1. The task is to gerrymander the following area so that the black party win more constituencies than the grey one. Draw your solution in the picture below.

The following rules apply: Each area shall contain exactly five settlements (indicated by the house icon). The areas must be continuous and not fragmented. **[3]**



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*Section F – Urban processes on global scale **[26]***

F.1. Study Figure F.1.1. and F.1.2. in SB!

F.1.1. Look at the four size categories of cities in Figure 1. Which two types have performed the fastest growth? **[1]**

F.1.2. In which region did cities grow the most, in which the least? **[2]**

Fastest growing	
Slowest growing	

F.1.3. Explain the connection between GDP per capita and urban growth figures. Distinguish shrinking, slowly growing and fast-growing regions and describe the typical level of economic development and urbanisation! **[3]**

Type	Region	Level of economic development	Level of urbanisation
Shrinking			
Slowly growing			
Fast-growing			

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F. 2.1. Create three sets of the countries according to figure F.2. in SB, based on their process of urbanisation depicted in SB! Include two examples of each set as well. Two of the sets must have a common section – give one extra example there. Name your sets! Draw your solution here! **[6]**

F. 2.2. Give two features about the urbanisation of each set! [6]

Name of the set you created	Features of their urbanisation
1.	a. b.
2.	a. b.
3.	a. b.

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F. 3. Study figures F.3.1. and F.3.2. in SB!

There are many different indices scaling and ranking global cities. They use different methods to measure the weight of a city. In SB we gave you two ranking systems in Figure F.3.1. and F.3.2.

F.3.1. Study the ranks! Give at least two different factors which could make difference between the two indices depicted in SB! **[2]**

F.3.2. Write a short essay in 8-12 sentences on city rankings. Evaluate all possible values measured in the indices and analyse their stability when ranking the cities. Discuss and predict the possible changes in global city ranks in the next 20 years. **[6]**

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Congratulations! You have finished the test! If you found it hard then likely others think the same …