HunGeoContest.org

14th Hungarian Geographical Contest 2022/23

2nd Round

Written Test

Question and Answer Booklet
Answers

27 January 2023

Password: ....

Date of birth: ....

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 **140 points.** Each section has a different maximum value:

A	20
B	24
C	24
D	24
E	24
F	24

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, crayons, and pencils during the test.

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

Good luck!

A.   Hot topic [20 marks]

The impacts of climate change have been observed all around the world. For example, the mean global temperature has already risen by 1.1°C since 1880. This makes it important not only to mitigate climate change by reducing greenhouse gas emissions, but also quantifying the impacts of the observed and expected climate change, in order to conceptualizing adaptation measures to climate change.

In the following case studies, we invite you to think about the potential climate adaptation measures based on observed and expected climate change impacts. An adaptation measure may mean for example planting drought resistant crops, as droughts are likely to become more common in certain areas due to climate change.

A.1. GERMANY

A.1.1. Study maps at A.1. in Source Booklet (SB). What trends are observed? (Mention two key characteristics and use examples to demonstrate your observations.) [2 marks]

Number of hot days increased

North-south divide

A.1.2. What health impacts does the increased number of hot days might have? [2 marks]

respiratory and cardiovascular diseases

consequences of dehydration

allergic symptoms

increasing sensibility to meteorological events, causing migraine for instance

A.1.3. Explain, why hot days could heavily impact the residents of Germany? [2 marks]

because it's an ageing society with high proportion of elderly residents.

A.2. INDONESIA

A.2.1. Study the graphs and the text in the box at A.2. in SB. Describe in 2-3 sentences, how precipitation and temperature will change in Indonesia over the next 30 years? [2 marks]

While annual precipitation will increase in most of the country, in certain areas it will decrease. It will increase by over 300 mm in most areas of Borneo, mid-Sumatra and most parts of New Guinea. Most areas of Sumatra and Java, the central parts of Celebes (Sulawesi) will experience lighter increases in annual precipitation – between 120 and 240 mm. The southwestern parts of Sumatra, most areas of Celebes (particularly the north and south), as well as the Lesser Sunda islands will be impacted by decreasing precipitation – between 60 and 120 mm.

Annual mean temperature will increase in the entire country by over 3°C. In some areas, it will increase even further – by about 3.5-4°C in the central parts of Borneo and Sumatra.

A.2.2. Starting from the characteristics of Indonesia shared above and expected climate change dynamics, write three examples of how climate change might have an impact on Indonesia. [6 marks]

- Losses in the agriculture sector due to reduced crop yields (e.g. reduced rice productivity due to heat stress, droughts, floods and sea level rise). This has an impact on people's livelihoods and nutrition, as well as the overall GDP.
- Human health: increased likelihood of vector-borne diseases (e.g. malaria), heat-related deaths, flooding can increase mortality and the number of wounded people
- Biodiversity: biodiversity loss - increased coral bleaching, degradation of mangroves, decrease in fish populations, species in rainforests and peatlands can go extinct, biodiversity loss in forests and peatlands due to wildfires
- Fisheries: decreasing fish populations can threaten fishing which can have an impact on the population's diet, livelihoods and fishing revenues.
- Tourism: increased heat stress for tourists, decreasing tourism revenue due to biodiversity loss, increased coastal erosion might have an impact on coastal tourist resorts
- Water resources – increased water shortages during the dry season, increased salinisation of groundwater and freshwater, flooding can have a deteriorating impact on freshwater quality
- Population will be affected by sea level rise – certain people will have to move
- Model answer with some examples, other correct answers can be accepted. Source: USAID, 2017

A.2.3. What adaptation measures can help to reduce the impact of climate change in Indonesia? Write three examples. Examples must reflect the local conditions. Avoid general findings. [6 marks]

- Plant climate resilient crops
- Improve flood protection (ideally via nature-based solutions)
- Reduce heat exposure in buildings (e.g. increase shading on buildings, fit buildings with cooling systems operated via clean energy, such as solar panels)
- Apply building codes (do not build in areas that are prone to floods or coastal erosion, take coastal protection measures, reduce the impermeable surfaces in urban areas)
- Increase green areas in cities to reduce the urban heat island effect
- Improve early warning systems for floods, storms, heatwaves, etc
- Increase water retention capacity in the rainy season
- Model answer with some examples, other correct answers can be accepted.

B. Icy conditions refuelled [24 marks]

When exploring a research topic, geoscientists are usually in need of a dating technique to determine the time and length of Earth surface processes, climatic periods, the changes in ecosystems etc. In this task, you will get to know a novel method, the so-called cosmogenic nuclide dating and learn how to benefit from its data.

Terrestrial cosmogenic nuclide dating: This dating technique uses cosmogenic nuclides (e.g., ^{10}Be, ^{26}Al, ^{36}Cl) produced in-situ in rocks exposed to cosmic radiation due to nuclear reactions occurring within crystal lattice of minerals.

B.1. GLACIGENIC LANDFORMS AND THEIR IMPORTANCE

B.1.1. Based on figure at B.1. in SB, describe the origin of erratic boulders in three sentences. [2 marks]

Transported by ice sheets

ice covers melts/retreats

boulders remain deposited

(boulders appear on the surface)

B.1.2 ¹⁰Be surface exposure dating of erratics [6 marks]

In SB B.1.2. you can see a nice field example of erratics. They are quite widespread in the southern Baltic area, hence can be a useful tool to reconstruct past ice-marginal environments.

Your task is to mark the erratics found in SB Table B.1.3 in the following map (available in colour in SB B.1.4.), according to the three phases (marked with solid, dotted, and dashed lines).

Note that their relative position to the ice sheet limits is important, not the exact geographical location.
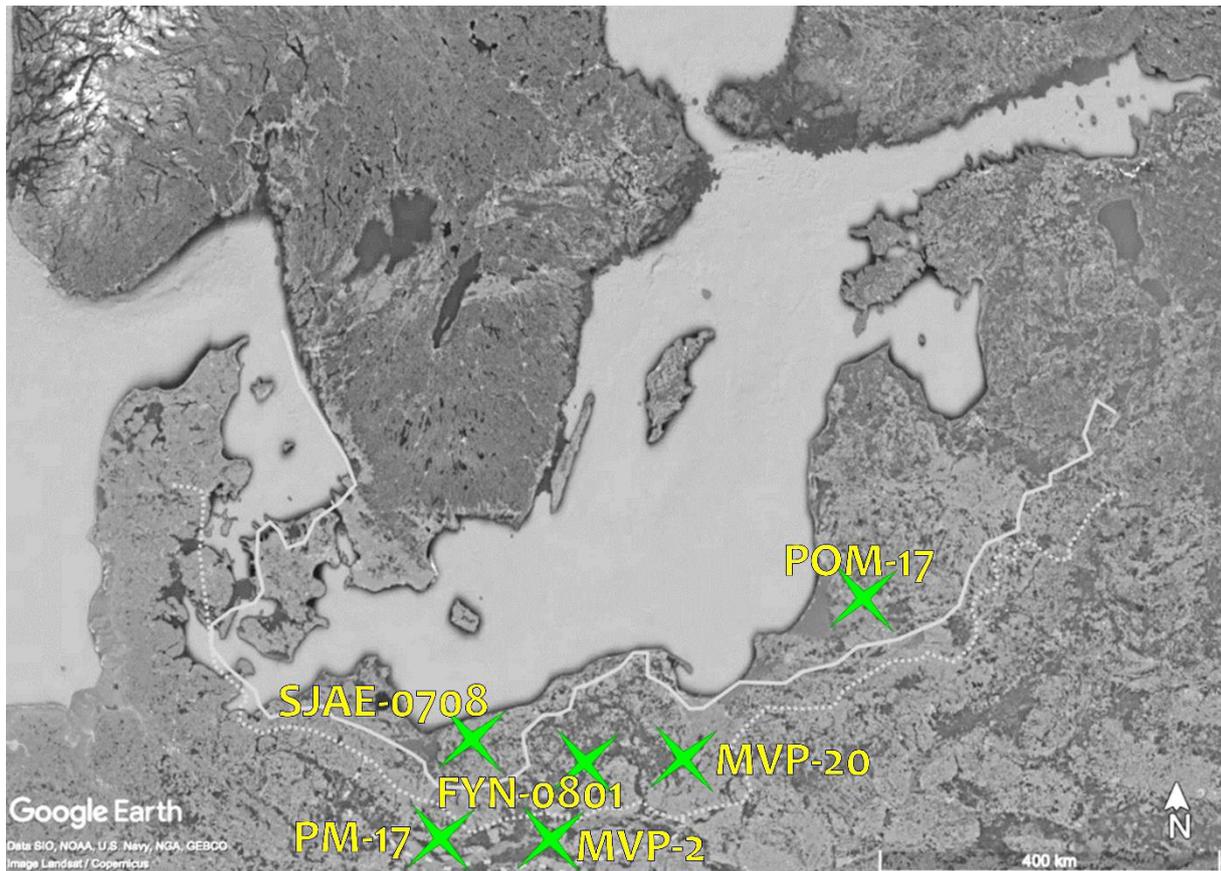
The southern Baltic area with the three major ice sheet limits during the last **glacial periods (make your markings here, and <u>not</u> on the map of the SB)**
Other marking might accepted, if their relative positions (to the edges of ices sheets and to each other) are defined correctly.

B.2. DESCRIBE THE GENERAL LANDSCAPES OF **D**ENMARK, **L**ITHUANIA, AND NORTHERN **P**OLAND IN 6-8 SENTENCES. **Focus on the forms with glacial origin. Pictures at SB B.2. may give you a hint. [8 marks]**

Keywords:

- undulating surface

- no sharp features, smooth surface

- low relief

- low elevation

4

- water bodies in depression

- glacial lakes

- unconsolidated covering sediments

- strong, visible wind activity → for instance sand dunes

- vegetation: deciduous, coniferous

B.3. TRUE OR FALSE – JUST A FEW MORE WORDS ABOUT THE ICE SHEETS [8 MARKS]

| Statement	True	False
Meltwater also plays an important role in forming glacigenic landscapes.	X	
Ice sheets reach the same latitude everywhere.		X
Melting ice covers have no impact on global climate.		X
The approximate flow direction of rivers Elbe and Vistula were the same as today during the last glacial period.		X
Glacial till (the sediment transported and deposited by ice streams) has no visible stratification.	X	
Both coniferous and deciduous forests were found around the last ice sheets.	X	
Surfaces with overlying late Tertiary sediments in Germany had lower erodibility during the glacial maximum than the Precambrian igneous and metamorphic rocks in Sweden.		X
River valleys of former meltwater streams formed on sand plains served as canal shipping routes at the dawn of the industrial revolution.	X	

C. Journey on the Niger River [24 marks]

The Niger River is the main river of West Africa, with a total length of about 4,180 km. Although is far less known, than his longer "cousin", the Nile, it plays a significant role in several countries' economy, and, it has some geographical peculiarities interesting enough to be a topic of our competition.

C.1. ZONALITY LIKE IN A TEXTBOOK

Africa has always been a textbook example of the geographical zonality. The Niger crosses different climates through its journey, therefore it is a perfect example of this classical topic.

C.1.1. Study climate charts at C.1. in SB along the Niger. Mark the estimated location of the four diagrams (A-D) on the map here. [2 marks]
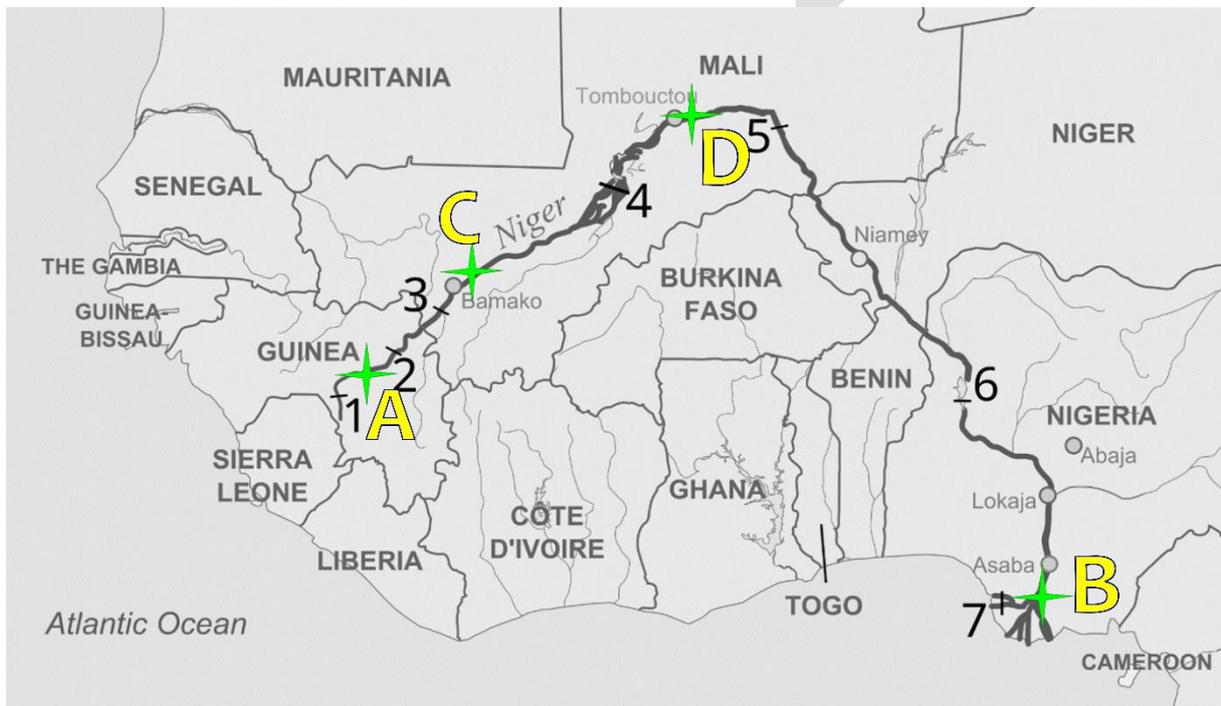
Alternative versions of A &C are accepted to the lower section of the river, if relative positions are correct.

C.1.2. Fill in the table with answers regarding the climate charts B, C and D. [3 marks]

Charts	B	C	D
Name of the climate type	Rainforest/tropical rainforest/humid tropical/Am	hot-semi arid/savannah/BSh	tropical desert climate/desert climate/BWh
Zonal soil	red soil laterite	savannah soil black soil	sandy soil desert soil
Three potential agricultural products	banana, cocoa, palm oil, coconut, sweet potato	cotton, peanut, wheat, millet	sheep, goat, dates, cotton, rice

C.2. Typically, a river gradually accumulates more and more water from its source to its mouth, and also slows down by arriving from the areas of higher gradient to the plains. However, Niger, as you can observe, has a strange course and an unusual longitudinal section…

C.2.1. STUDY THE SATELLITE IMAGES (E-K) OF C2 IN THE SB. FILL IN THE TABLE WITH THE INFORMATION REQUIRED. PAIR THE PICTURES AND THE NUMBERS IN THE MAP. [14 marks] *Note: every picture is oriented "normal", Northern direction is always on the top of the picture.*

Mark of the picture		Number in map	Further required information
E		5	What are landforms on the northern riverbank? Wadi, dry valley, temporary riverbed
F		2	Name the geomorphological form in the riverbed. shoals, sediment deposition, sand banks
G		1	Name the geomorphological form depicted. rapids, riffle
H		4	Name the geomorphological form depicted. delta, inner delta
I		7	Name the geomorphological form depicted. river mouth, oxbow lake, connection of two rivers, delta
J		3	Hints of what type of agriculture could be observed in this picture? slash-and-burn agriculture
K		6	What can be the primary function of this reservoir? energy production, fresh water reserve
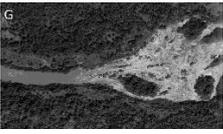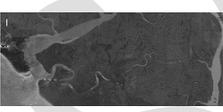
C.3. STUDY THE DIAGRAM OF THE NIGER'S DISCHARGE AT C.3 IN SB, COMPARE IT WITH THE CLIMATE DIAGRAMS (SB C1) AND ANSWER THE QUESTIONS.

C.3.1. How would you describe shortly the water regime of the Niger River? [1 mark]

unbalanced/ irregular/ uneven

C.3.2. How would you describe tendencies that can be observed in the discharge-diagram? [2 marks]

- overall mean discharge is slightly growing

- maximum discharge is growing

- no significant change in minimal discharge

- extremities are growing

- no extreme changes

**C.3.3. What could be the reasons behind these tendencies? [2 marks]**

- deforestation: runoff is quicker in areas that were formerly covered by forests

- climate change: extremities became more common; growing evaporation causes more rain

D. Lying with maps [24 marks]

Maps often use a distorted and falsified form of reality to successfully convey the information they contain. As Mark Monmonier, author of the book "How to Lie with Maps", writes: "Not only is it easy to lie with maps, it's essential." The examples in this exercise were inspired by his book.

D.1. ADVERTISING WITH CARTOGRAPHY

What do advertising and cartography have in common? Both communicate a limited version of reality. Maps used for advertising are more generalised, they are limited to a certain part of reality and do not show features that are not useful to the advertiser. On the other hand, they are more decorative than traditional maps because of their intention to attract attention and are often accompanied by pictograms. Two of the most important aims of advertisement maps are to show accessibility and attractiveness. Maps that show the easiest possible accessibility contain spatial distortion. Road networks are simplified and some places that are distant in reality are shown much closer. Another effective tool for generalisation is the careful selection of objects and names shown in maps. The advertiser is interested in having names in the map that increase revenue, make the environment look attractive or are possibly closely associated with the advertiser (strategic partnership). Take a look at the two maps below. Both are generalised representations of reality. The map of Rudy's store contains spatial distortion (Canton is in reality nearly 50 kilometres away, while East Hills is closer than Westvale), which is used to indicate "excellent" accessibility. The map of Karen's camp also shows easy access via the highway exit sign and illustrates the tourist attractions of the area to attract guests.

Source: Mark Monmonier, How to Lie with Maps

For this task, **the Miami Golf Club commissioned you to create a promotional map.** The map should show both the easy accessibility of the club and the attractiveness of the area without the overwhelming amount of information. You will gather some information during a meeting with the management. Golf club guests typically come from Houston, Los Angeles, Detroit and Havana. According to a recent survey, golf club guests are attracted by the city's sports and entertainment facilities. As the club cannot provide accommodation for its guests, the map should also show the availability of accommodation. Transport between the airport and the hotel is provided by taxi. However, as it is important for guests to get to the hotel quickly, the map should show a short route between the airport and the hotel. Although this is not public information, the club owner

has a close relationship with the management of the Laces Out hotel chain. **Maps in D.1 SB help you a lot.**

D.1.1. **Create an advertisement map** based on the description**,** the information collected and the following maps. Map of the road network of the municipality and the accessibility of certain services from OpenStreetMap. **You are allowed to use no more than three different colours.**
**[12 marks]**
Create your map here.

Evaluation:

-map should be easy to be read, must contain minimalised information that is needed;

-map should contain facilities that are connected to the local tourism;

-map should contain pictures, images or any kind of symbols;

-map should have some distortion, as it needs to emphasize mainly the hotels, bars and the golf club;

-map should have a legend;

-as an advertisement map, it's good to add a slogan or marketing text;

-map doesn't necessarily be directed to the North;

-map shouldn't contain legend;

Examples on good solutions:
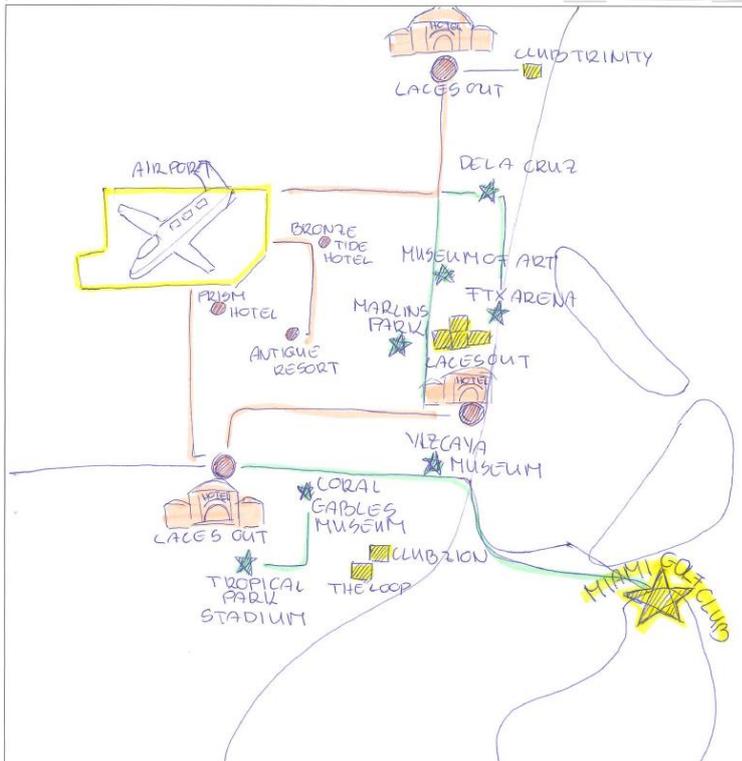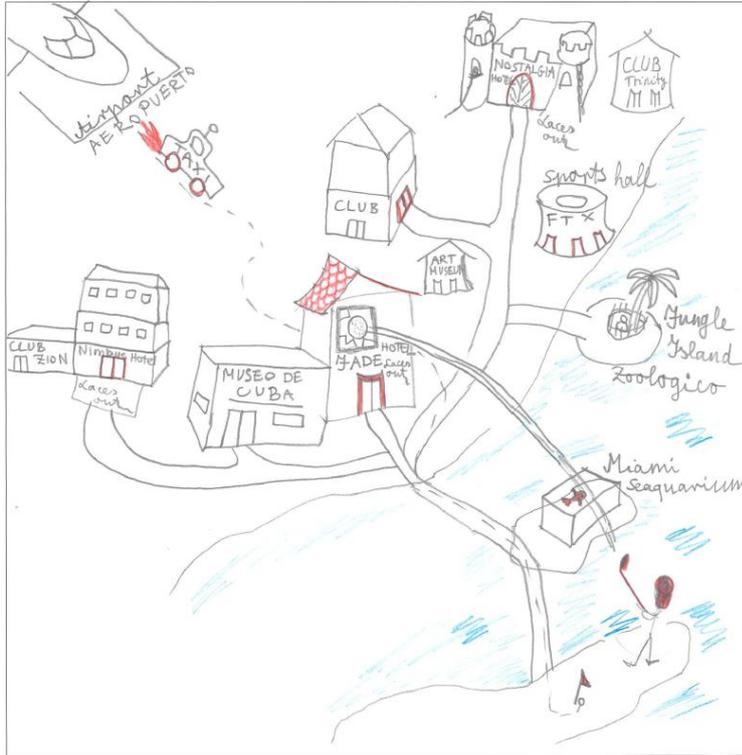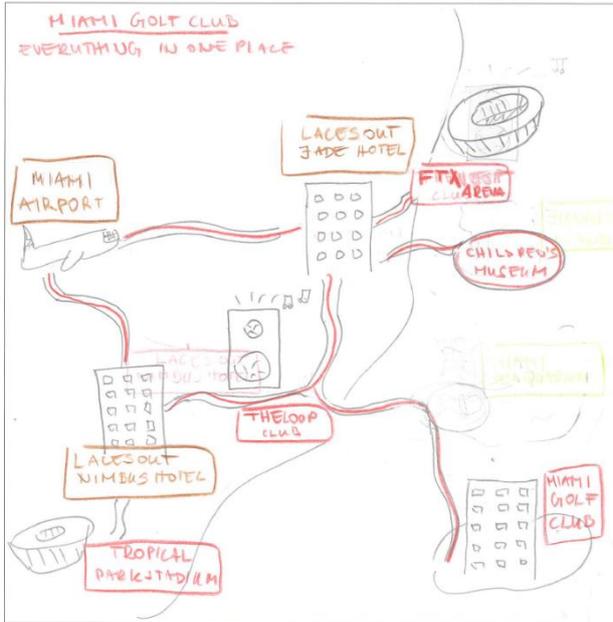
**D. 2. ONE COLLECTS STAMPS, OTHER COLLECTS PROVINCES.**

Nowhere is lying with maps more important than in political propaganda. Falsified maps can persuade a country's population and generate sympathy in the event of an international conflict. Propaganda maps can include elements such as the annexation of disputed territories to the mother country by clear symbols, or the way in which the name of a settlement populated with ethnic minorities across the borders is spelt.

D.2.1. Propaganda maps often appeared on stamps. The following exercise shows maps of disputed territories or borders not recognised by international conventions. **Name the state (one for every stamp) might have felt offended today by the issue of the stamp. One country may be listed in more than one place. Stamps are printed in SB D.2. in colour and in higher resolution. [6 marks]**

1		United Kingdom, Great Britain etc.
2		United Kingdom, Great Britain etc. / Morocco
3		India
4		Azerbaijan
5		United Kingdom, Great Britain etc.
6		Honduras
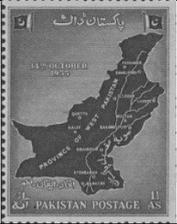
D.3. LOOK AT THE MAP IN SB D.3. ABOUT THE POST WW2-WORLD.

D.3.1. The editors of this map used several techniques to distort their image according to their interests. **Name three of these mapping techniques and evaluate their impact on the map** (map vs reality). **[6 marks]**
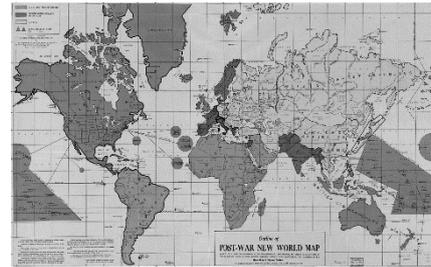
Mapping technique	Impact
• Projection • Colouring • Scale • Orientation	• North seems bigger than South. • Country's territories look bigger. • Sovereign countries counted in unions. • Seas and ocean territories coloured by country labels also depicts an increased territory. • Overall, all distortions depict the strength of central powers

E. The Gender Scenario

A huge demand on gender equality has appeared in many societies in the past decades, however the progress and the speed towards equity is different. In the following tasks you are to answer questions about the geography of gender (in)equality.

E.1. STUDY FIGURE E.1. IN THE SB AND ANSWER THE QUESTIONS.

E.1.1. In SB E.1. you can see the spatial distribution of the Gender Inequality Index by country, 2021. **Give three possible reasons for such geographical distribution of gender inequality. [3 marks]**

- religious culture

- education

- post-colonial issues

- economic development

- economic structure

- political stability

E.1.2. According to Figure E.1., explain shortly what gender inequality means [1 mark]

Legal, social and cultural situation in which sex and/or gender determine different rights and dignity for women and men, which are reflected in their unequal access to or enjoyment of rights, as well as the assumption of stereotyped social and cultural roles.*

*Source: European Institute of Gender Equality

E.1.3. Name one possible primary statistical data/variable to every category which could be used by the construction of an inequality index. [2 marks]

1. Demography	• mean age of women at first pregnancy; • mean age of women at marriage; • mean number of children/one mother
2. Economy	• job in different branches taken by women; • corporate leaders by gender; • average income by gender
3. Education	• proportion of illiterate women/men; • proportion of women in higher education; • proportion of women with a degree
4. Legal status	• minimum legal age of marriage; • legal act of dowry; • lows introduced to protect women; • personal freedom of women (if they belong to a male relative)

E.2. DETERMINE THREE GROUPS OF COUNTRIES BY THEIR **G**ENDER **I**NEQUALITY **I**NDEX **(GII) The groups must have specific cultural features as well. Name the groups, estimate the average Gender Inequality Index, name common cultural feature, and give examples. By the examples, you should add two, each from different continents. Fill in the table. [6 marks]**

	Name of the group*	Estimated value of the average GII	Cultural feature	Examples (2 each)**
1	• Low GII • Developed countries • Post-modern values	"NUMBER"	• Consumerist • Capitalist • Christian • Individualist	• Canada and Sweden
2	• Moderate GII • Developing/semi-developed • Modern or modernising	"NUMBER"	• Secularising • Marked oriented • Uniform	• Romania and Chile
3	• High GII • Underdeveloped or developing • Traditional values	"NUMBER"	• Highly religious • Muslim • Traditionalist • Patriarchist	• Afghanistan and Mali

*Should not be named after a region

**Should have named examples from two different continents

E.3. Study table E.3. in SB. In this table you can learn information on selected Latin American countries and their gender relations. **Now your task is to use some of these data to create a chart that describes differences in gender (in)equality**. Use at least three of the variables in the table, and you must create one mathematic variable of them. You may choose the type of diagram that best expresses your index. **[10 marks]**

E.3.1. DO YOUR CALCULATIONS HERE**:**

Criteria of calculations:

-calculation should be described well: which values were used, what formula was used

-created variable should be described what it depicts exactly

-there were no strict rules of which mathematical formula should the contestants use, but any calculations must have been correct

E.3.2. DRAW YOUR CHART HERE**:**

Criteria of Charts:

-charts must be easily read, be clear and organised

-charts must depict well the variables the contestant created

-charts must be labelled and contain well differentiated axes (X and y)

-charts should be designed and coloured well

E.4. Study maps at E.4. in the SB. Compare them with sources E.1. and E.2.

E.4.1. What contradictions can you recognise when evaluating figures E.1 & 4. and your chart? Find <u>two</u> contradictions and explain them. [2 marks]

GII in Latin-America doesn't depict huge differences, while in maps E.4. women workforce shows remarkable distinctions. Possibly employed women are not calculated in GII value

GII in Latin-America doesn't depict huge differences, while in maps E.4. quotas for women representatives changing on a wide scale. Having a minimum quota for candidates doesn't mean they are being elected.

In my chart the values of … and … were high/low/moderate etc., while GII values/E.4. maps show the opposite.

Multiple correct answers are accepted, if the contradiction is described and explained with good reasons.

F. Japan – from miracle to sunset? [24 marks]

For the generations of the baby-boomers and the X-gen, Japan was the symbol of rapid modernisation and breakneck economic growth – something, like China for the Millennials. However, during the last three decades, this Asian power has been more often referred as a slowly developing economy with many structural challenges. In the following block, you have some questions about the economic geography of Japan.

F.1. We hope, it is not a dramatically new information to you, but Japan is located on four large and several small islands – 6,852 according to Wikipedia. Although it is a quite densely populated country overall, the distribution of the population is one of the most unbalanced on the globe.

STUDY MAPS F.1 IN SB AND ANSWER THE QUESTIONS.

F.1.1. Give three possible reasons of the current distribution of the population. [3 marks]

- Mountain ranges in the middle of the country

- At coasts, fishing industry and trade

- North-South divide of the climate

- Migration tendencies

E.1.2. Give two benefits and two problems of the current distribution of the population [4 marks]

+	**–**
- Main centres could easily be connected - Despite high density, there are spaces for natural environment - Easier administration - Huge labour market - Short supply chains	- Crowded cities - Shortage on land - More people are exposed to typhoons - Spread of diseases is quicker - Vulnerable natural-, social- and infrastructural systems

F.2. Study the graphs of F2 in SB. They are borrowed from Harvard Atlas of Economic Complexity, which ranks economies using their own complexity index. Despite all signs of the crisis, Japan is ranked 1ST in 2021.

F.2.1. Graphs F.2. 1-4 represent the major foreign trade partners of Japan in 1995 and 2020. **Please select the appropriate graph and give their number to the right box** [4 marks]

Japan's main export partners in 1995 **3**	Japan's main import partners in 1995 **4**
Japan's main export partners in 2020 **2**	Japan's main import partners in 2020 **1**

F.2.2 China is often referred to as taking a similar but delayed path of economic development. **Select from the graphs F.2.5-6.** [2 marks]

Export structure of Japan, 1996	**6**
Export structure of China, 2020	**5**

F.3. Now, you have to use each graph in section F to give the correct answers. In the followings, you will read some sentences consisting of two parts, connected with "because". First part is the statement, second is the reasoning. You have to mark… **[6 marks]**

A – if both statement and reasoning are true, and the two parts connected to each other (part 2 gives a real cause for part 1)

B. – if both statement and reasoning are true, but there is no possible connection

C – Just part 1 is true, part 2 is false

D – Part 1 is false, part 2 could be true,

E – Both part 1 and 2 are false

1.	In the last decades, despite of the growing significance of China, South Korea and Taiwan were able to keep their significance as trade partners for Japan **_because_** their economy provides simpler industrial products, consumable goods for the Japanese customers.	**C**
2.	The current stage of economic growth in Japan could be characterised as expansive, **_because_** Japanese employees spend more hours with work that in any other major economic power.	**E**
3.	Global recession in 2009 and 2020 hit the country hard, and the decrease of GDP is typically greater than the global average **_because_** Japan is still a highly export-oriented economy, deeply integrated into the world markets.	**A**
4.	The combined share of such resource-oriented economies like Saudi-Arabia, Canada, Brazil, Australia, or Chile has been decreased between 1996 and 2020, **_because_** Japan's economy became more self- sufficient from resources.	**C**
5.	The decades of economic miracle were over gradually by the early 1990s **_because_** other Asian powers started to emerge.	**D**
6.	The overall GDP growth has remained small during the most of the past 30 years **_because_** the dependency from the imported energy remains a significant issue.	**B**

F.4. Workforce has always been a key element of Japan's economic miracle. Being the only major power with a strongly decreasing population, the conditions of extensive growth are not really available.

F.4.1. Compare graphs F.4.2. & 3. Describe the connection between GDP growth and per capita GDP-growth. [2 marks]

Overall GDP growth is slowing, per capita GDP growth is high due to decreasing population numbers.

F.4.3. Give three possible methods how the economy of Japan adopts to the shrinking and aging labour force. [3 marks]

More women are integrated into the labour market

Automatization and industrial robots

Late retirement, high retirement age

Longer working hours

Increasing taxes

Reduces pensions

Enforcing retirement insurances during active years of work

Increasing focus on silver economy

Congratulations! You have finished the test!