Hungarian Geographical Contest

Written Test

12. 7.12. 2015.

ANSWERS

Question and Answer Booklet

Instructions:

1. Fill in your password on the front page of this Booklet and on the top of the pages as well.

2. The test consists of 6 sections.

3. A maximum of 100 marks can be earned.

4. Only the required number of answers (reasons, examples etc.) will be accepted in the order as 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.

5. All questions should be answered in the spaces provided in this booklet.

6. You can find all the sources (Maps, Figures) referred to in the Source Booklet.

7. You may use a calculator during the test.

8. You have 180 minutes available to answer all questions.

Good luck!

Section 1 – The Old Man and the Sea *(15 points)*

1. *Study **Source 1a** in the Source Booklet, which shows the location of the Great Pacific Garbage Patch! (5 points)*

   a. Name three natural reasons, which **cause and form ocean circulation and current movement**! (3 points)

   1: Winds (1 p)

   2: Coriolis effect (1 p)

   3: Density differences in water masses, position of landforms (1 p)

   OR location and form of continents, salinity of the oceans

   http://oceanexplorer.noaa.gov/facts/currents.html

   b. Name two **natural ways of transportation** which help garbage to reach the middle of the ocean from land! (2 points)

   1: Winds (1 p)

   2: Rivers (1 p)

   OR Ocean currents, animals, storms

2. *Study **Source 1b** in the Source Booklet about the environmental effects of the debris. (10 points)*

   a. Name the **negative effects of marine debris**! Write three effects in each field! (3 points)

	Negative effects
Ecological	1. Marine animals can eat plastic with their natural food and can get fatal injuries 2. Whales, dolphins can be trapped by nets 3. Coralls can be damaged by hazards from debris

Socio-Economic	1. Scares away tourists from beaches, less profit for hotels, less tax for countries 2. Plastic litter gets inside ships propellers and keels, making ship maintenance more expensive 3. Fishermen can't make a living from fishing. Fish with higher concentration of hazards can damage human health.

b. Explain why **ocean pollution** is a global problem? (3 points)

It affects not just the countries where pollution come from but also other areas and countries around the globe. Marine debris can harm the wildlife in large territories.

It causes significant ecological, economic and social costs.

Collective actions needed to achieve solutions for pollution. It influences transportation and people living in coastal areas and only global prevention can make solutions.

c. Give some possible solutions how societies can **prevent or reduce** ocean pollution! (4 points)

Reusing more plastic, which is the most common component of garbage (raise awareness of this type of environmental problem).

Keep beaches tidy in coastal areas. Developing effective methods to locate marine debris accumulations.

Develop capacity and coordination mechanisms for marine debris removal.

Build capacity to enforce all appropriate legislation to reduce discharge of solid waste.

Make restrictions to stop illegal discharge or abandonment of vessels.

Section 2: The Lost World *(14 points)*

1. *Study **Source 2a** in the Source Booklet! Identify the **three main types of erosion** caused by water! On which climate is this erosion process more effective? Why? (4 points)*

   A. *Splash* (1 p)

   B. *Sheet* (1 p)

   C. *Gully* (1 p)

   Climate type: Drought (0.5 p)

   Reasons: The drought reduced the stability of the slope. (0.5 p)

2. *Study **Source 2b** in the Source Booklet! Name the **US national park** where these pictures were taken! (1 point)*

   Death Valley National Park

3. *Study **Source 2c** in the Source Booklet! In the first weeks of October there were record rainfalls in this area. Describe the effects of heavy rain on the landforms, landscape! Name two of the **natural hazards** that could appear in the area! (4 points)*

   a. Effects: The area is without vegetation cover. First the splash erosion moves the particles. The surface is covered by fragmented rocks, so the sheet erosion can wash away sand, smaller rocks. The rills, gullies are deepening and widening. The water can wash out the ground below roads.

   (3 p)

   b. Natural hazard 1: floods, mudflows (0.5 p)

   Natural hazard 2: coastal erosion, debris flows (0.5 p)

*4. Name that **extreme climatic phenomenon** that cause the heavy rains in this region! Describe the process and write two examples of its other effects! (5 points)*

a. Name of phenomenon: El Nino (1 p)

b. Description of the process: El Niño is the result of an on-going "dialog" between the ocean and atmosphere in the tropical Pacific Ocean. It is part of a natural, combined oceanic-atmospheric cycle referred to as El Nino-Southern Oscillation (ENSO).

The term El Niño refers to the large-scale ocean-atmosphere climate interaction linked to a periodic warming in sea surface temperatures across the central and east-central Equatorial Pacific.

As warm water shifts eastward, so do the convection and heavy rains caused by the increased buoyancy of air warmed by the underlying water. As warm water piles up in the east, upwelling of cold, nutrient-rich water is inhibited.

Although El Niño (and La Niña) are generated in the tropical Pacific, their effects are felt all over the world. The process by which Earth system events in one location are related to events in a different part of the world is called teleconnections.(3 p)

c. Two further effects: Heavy rains on islands of Pacific and the west coast of South America; Drought in Australia, Indonesia, and the Philippines; Warmer-than-normal winters in northern US and Canada; Drought in Africa and India; Weakening of Atlantic hurricanes; Greater precipitation in SW United States; Diminished upwelling of cold, nutrient-rich water upon which phytoplankton depend. This affects fish, birds, etc.; Coral bleaching; Human health: famine, water pollution, diseases such as malaria, dengue fever and cholera. (1 p)

Section 3 − The Magic Mountain *(15.5 points)*

1. *Study **Source 3a** in the Source booklet! Year by year, more and more climbers reach the summit of Mount Everest. If the annual total climbing deaths are plotted, an increasing trend is also observed. Furthermore, there are peaks of high death rates, and if the 2015 data would be shown, an even higher annual death toll (19) would be noticeable (5 points).*

   a. Account for the **increasing number of successful ascends**!

   Climbing is more popular, better equipment, better weather forecast, higher standard of living.   (1 p)

   b. Suggest reasons for the **increasing fatality rate**!

   Climbing routes and camps are more crowded, less experienced climbers, hikers.   (1 p)

   c. Define the reason for the **high total deaths in 2015**!

   April 25 avalanche   (1 p)

   d. Determine the **triggering factor** for 2015 natural phenomena in the Everest region:

   Earthquake   (1 p)

   e. Identify the **natural phenomenon** responsible for the fatality peaks!

   Avalanches and storms   (1 p)

2. *Many of you must have seen the movie 'Martian'. Mars, the red planet possesses many interesting geomorphologic features, like the Olympus Mons. Study **Source 3b** in the Source booklet! You can see the Olympus Mons on the picture, which is about three times higher than the Everest, and would cover a two-third of the land area of France (5 points).*

a. Define the **origin of Olympus Mons**, how was the mountain created.

Shield volcano, basaltic rocks, low viscosity of lava   (1 p)

b. Name **two similar mountains** on Earth similar to Olympus Mons.

Mountain 1: Manua Loa   (0.5 p)

Mountain 2: Manua Kea   (0.5 p)

3. *At the beginning of the movie the rocket is almost tipped over by a windstorm of 110 kmph.*

a. **Justify or refute** the statement for Mars!

Not possible because of the low atmospheric surface pressure (0.7-0.9 kPa).   (1 p)

b. In the movie, the astronauts walked the same way as on Earth. Discuss **the feasibility of this statement**. If you are standing at 5'9", explain whether you would be able or not to dunk on Mars.

One would walk more easily, as gravity is three times lower than on Earth (3.7 m s-2). Most likely you would dunk easily.   (1 p)

c. If you had run out of oxygen on Mars, **assess the possibilities** to replenish your oxygen supply. Name at least two options!

Oxygen can be exploited from rocks and polar ice caps and also from groundwater and permafrost.   (1 p)

4. *Study **Source 3c** in the Source Booklet! The four volcanoes in the photos are located in the same mountain range. The volcano on the lower left photo holds the record for the highest annual snowpack, about 29 meters of snow*

in a single winter season. The volcano in the upper right corner had a large catastrophic eruption on May 18, 1980 (5.5 points).

    a. Name the **mountain range** where these volcanoes are located at!

Cascades (1 p)

    b. Explain the reason for this **large snowpack** (Picture B)!

Westerly winds, close to the ocean, orographic effect (1 p)

    c. Describe the **origin of these volcanoes**!

Located in a subduction zone, Juan de Fuca plate subducts underneath the North American plate. (1 p)

    d. Define the **specific name** for this kind of volcano!

Strato or composite volcano (1 p)

    e. List at least **three types of rocks** associated with these volcanoes!
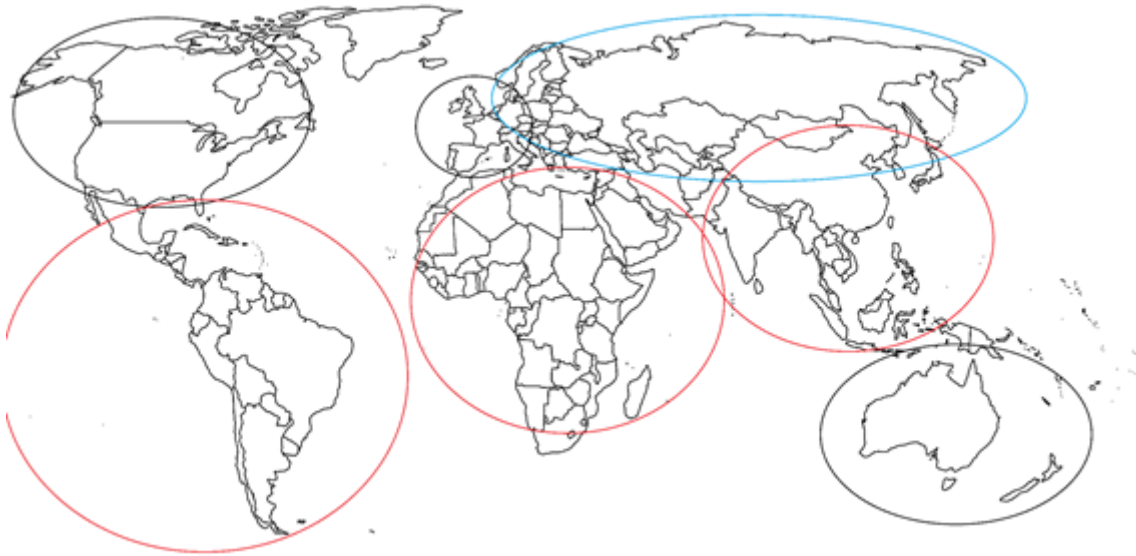
Dacite, andesite, rhyolite (1.5 p)

Section 4 − The Lord of the Flies *(17 points)*

1. *Study **Source 4** in the Source Booklet and answer the following questions!*

   a. Describe the **characteristics of these countries' population** for each population pyramid! (*6 points*)

	Country A	Country B	Country C
Births and deaths	High birth rate and low death rate	Low birth rate and high death rate	Mediocre birth and death rate
Type of population growth	Growing	Declining	Steady
Approximate median age	Low median age	High median age	Mediocre median age
Men/women ratio	Men > women	Men = women	Men < women

   b. Locate **cluster of countries** on the map given below with similar population features as it can be seen on the population pyramids! Mark one cluster for each population pyramid! Draw a circle framing to mark them on the map! (*3 points*)

2. *There is a bigger city in a country with a population that could be depicted with population pyramid B. Your task is to determine* **the orientation of the city's development plan**. *You have several instruments you can choose from, like raising new buildings, subsidize certain public services. With the help of the information provided on population pyramid B, outline your plans for the city and also justify them as well in a maximum 10 sentences long argument. (8 points)*

Country B could be described with ageing and declining population, therefore…

Plans can be passive (accept these phenomena) or active, which would like to divert the present tendencies. Both approaches can be accepted.

Plan services (from pharmacies to cemeteries, from recreation to suitable health and elderly care) and infrastructure (from housing to disabled access public transport) that fulfil the needs of the ageing groups.

If the city government accepts the shrinking (declining population figure), institutions and services, which are presently underutilised (because of the missing young generations) should be closed or converted to useful ones (e.g. elderly care instead of kindergartens). If the decline of the population cannot be stopped, then the city has to

cut expenses (e.g. on social care) and increase its own income (higher local taxes, less incentives, more expensive public services) to balance its budget.

To promote the increase of population either immigration to the city or the incentives for bigger families should be chosen among future plans. The combination of both above will increase the efficiency. New jobs, better services (family-friendly), reasonable housing, modern (eco- or nature friendly solutions, approaches) city policy can attract young intellectuals (highly qualified, well paid, therefore good taxpayers). All the above investments can also help keeping the present dwellers of the city from migration to other locations.

Section 5 – 80 Days around the World *(19 points)*

*1. Study **Source 5** in the Source Booklet. (7 points)*

a. Fill the table with the right country code! (3 points)

	Country code (1,2,3,4)
This country with no coastline has a relatively stable economy and corruption is not common	Country 1
Clothes are the most important products for export	Country 2
This country has a large labour force but workers' circumstances are not very good	Country 2
This country is a neighbour of a big economic power	Country 4
This country's labour force is highly skilled, but rather limited in numbers.	Country 1
The country's population is not exceeding 50 million people and its economy is highly dependent on world crude oil price	Country 3

b. Name these countries! (4 points)

Country1: Slovakia   (1 p)

Country2: Bangladesh   (1 p)

Country3: Venezuela   (1 p)

Country4: México   (1 p)

*2. Imagine you are a decision maker of a big company and you would like to **relocate** some part of your company's economic activity to a new country! (12 points)*

a. Give reasons for your chosen country with the help of **Source 5** in the Source Booklet and name the country! You can choose one country twice! (6 points)

Decision maker as a…	Reason 1	Reason 2	Chosen country (write code)
football boot manufacturer company	Huge labor force	Flourishing clothes export	Bangladesh
pharmaceutics company	Highly skilled labor force	Stable economy	Slovakia
oil rig company	Reach in natural resources	Situated near large transportation routes	Venezuela, México

b. Explain why investments are **beneficial and disadvantageous for host country**! (6 points)

	Positive impacts (+)	Negative impacts (-)
Socio-Economic	1. Financial incomes (taxes), more jobs 2. Higher wages comparing other jobs available in that country 3. Improving healthcare, education	1. Local producers unable to compete 2. Brain drain, encourages dependency 3. Health and safety issues OR Inequality

	OR Improved infrastructure/telecommunication	

Section 6 − The Tale of Two Cities *(19.5 points)*

*1. Name two advantages and two disadvantages of **each type of transportation**, which is listed in the table below! (8 points)*

	Advantages	Disadvantages
Road traffic	door to door service, personalized solution, fast, flexible, widespread, etc.	expensive, large environmental impact, traffic jams, expensive infrastructures, noise pollution, more dangerous than others, threaten wild animals (e.g. forest mammals), etc.
Rail transport	fast (usually), lower environmental impact, usually comfortable, cheap cargo transport, large amounts of goods can be transported, safe, the weather has smaller effect on it, etc.	fixed track (inflexible), costly construction, noise pollution, limited capacity (trains/track), depends on timetable, etc. Elevation sensitive way of transport!
Water carriage	cheap freight transport, large amounts of goods can be transported, small environmental impact, less investments, convenient for passengers, etc.	slow, inflexible, require transshipment, exposed to the weather, piracy, would be dangerous for wildlife (e.g. sea wildlife, water birds), limited travelling ways, etc. Landlocked/arid climate countries almost excluded.
Air traffic	fast, low prices for passengers (projected to 1 passenger kilometer), planes can use the shortest routes, less investments, it can reach places off the beaten track, usually convenient	large environmental impact, strongly influenced by natural forces (weather, volcanic ash), limited cargo capacity, threaten wild animals (especially birds), terrorist threats, spread of epidemics, noise pollution

*2. Two cities, Ciudad el Conquistador and Castillo Blanco are located on a plain at a distance of 500 km as the crow flies. At present there is no transport connection between them, however there would be a demand for it. According to estimates 6 million people and 15 million tons of goods would exchange between the two cities per year. **Calculate the transportation facilities separately for passenger and cargo traffic** (each*

*element of the infrastructure may supply only one function) between Ciudad el Conquistador and Castillo Blanco, **which can be built for the lowest price**. Use the table below and your own knowledge. Ciudad el Conquistador lies 100 km while Castillo Blanco 150 km away from the sea. The land connection can be calculated in air kilometres. (4 points)*

	Investment costs	Passenger capacity (million people/year)	Cargo capacity (million tons/year)
Highway	€ 40 million/100 km	2.5	4
Railway	€ 45 million/100 km	3	7.5
Water traffic	€ 50 million/dock	0.8	16
Air traffic	€ 80 million/terminal	2	0.4

Do your calculations here:

    a. Cheapest for passenger traffic: railway OR € 450 million   (1 p)

    b. Elements of infrastructure to be built: two railway tracks OR a double-track railway OR 1,000 km of railway OR 2x500 km of railway   (1 p)

    c. Cheapest for cargo traffic: water transport AND railway (between cities and ports) OR € 325 million   (1 p)

    d. Elements of infrastructure to be built: two ports AND 2x250 km of railway OR 500 km of railway OR 2x100 km of railway (between Ciudad Rodrigo and the sea), 2x150 km of railway (between Castelo Branco and the sea)   (1 p)

3. *How much would be the **maximum capacity** of these infrastructures? (1 points)*

    a. Passenger traffic: 6 million people/year   (0.5 p)

b. Cargo traffic: 15 million tons/year (it is limited in 2x7.5 million tons/year because of the maximum capacity of the railways) (0.5 p)

4. *According to further estimates after 5 years passenger traffic will increase to 7.8 million people/year and cargo traffic to 18.5 million tons/year. What **additional investments** would satisfy the future needs, if the diversification of transport facilities will become priority? What costs will it have? (4 points)*

Do your calculations here:

    a. Passenger traffic: air traffic   (1 p)

    b. Costs: € 160 million (to build 2 airports)   (1 p)

    c. Cargo traffic: highway   (1 p)

    d. Costs: € 200 million (to build 500 km of highway)   (1 p)

5. *Study **Source 6** in the Source Booklet! You can see two other cities – Muntanya Darrera and Pueblo Campo Plano. The distance between them is also 500 km. The politicians decided on the construction of a highway among the cities. The engineers planned two different paths for it. "Path A" would connect the cities as the crow flies, and it would go through the mountain with a 50 km long tunnel. This highway would be all in all 500 km long. "Path B" would bypass the mountain and cross three rivers with a 3-km, and two 1-km-long bridges. This highway would be all in all 800 km long. Calculate and decide, which is the better path for the highway and why? Use the following table, map and your own knowledge. (2.5 points)*

Cost of highways:	€ 400,000/km
Cost of bridges:	€ 2,000,000/km
Cost of tunnels:	€ 2,960,000/km

Do your calculations here:

"Path A" would be better because, however the prices are equal, the shorter path has resulted smaller environmental impacts and the tunnel does not sever habitats and does not disturb animal migration routes, etc.

OR:

"Path B" would be better because, however the prices are equal, the longer path has resulted more potentially connected areas and settlements therefore the region would have more impacts for development, etc.

(2.5 p)