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| **Masarykova univerzita**  Centrum jazykového vzdělávání na Přírodovědecké fakultě | | | |
| Mock Test JA001 Mathematics | | | |
|  | |  |  |
| **Name:** | | | **UČO:** |
| Listening: |  | | **Subtotal**  *(****31*** *points out of* ***52*** *to pass)* |
| Grammar & Vocabulary: |  | |
| Reading: |  | |

**Task 1 Listening**

**Complete the sentences with one word or number. At the exam, you will hear the recording twice.**

*(1 point per item; 7 points)*

1. The TV series such as *The Bionic Woman* or the *Terminator* where the characters are a mixture of technology and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2. *The Bionic Woman* is a programme about a patient whose arm was \_\_\_\_\_\_\_\_\_\_\_\_\_\_ in an accident.

3. The woman is being treated in a hospital where they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ a bionic arm which fits onto her shoulder.

4. The doctors are \_\_\_\_\_\_\_\_\_\_\_\_\_ that she will be able to do the things we take for granted.

5. Bionics is very good for people who have lost their \_\_\_\_\_\_\_\_\_\_.

6. The possibilities of biotechnology seem to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

7. The documentary will be on TV today on Channel 10 at \_\_\_\_\_\_\_\_\_\_\_\_.

**Task 2**

**Complete gaps 1-8 in the text below with the following words. There are three words that you will not need to use:**

*(1 point per item; total: 8 points)*

***square hides product converges sum constant spiral diverges cube predecessor continues***

**What is the Fibonacci sequence?**

The Fibonacci sequence is a famous group of numbers beginning with 0 and 1 in which each number is the (1) …….of the two before it. It begins 0, 1, 1, 2, 3, 5, 8, 13, 21 and (2) …….. infinitely. The pattern (3) …….. a powerful secret: If you divide each number in the sequence by its (4) ……… (except for 1 divided by 0), then as you move toward higher numbers, the result (5) ………… on the constant *phi*, or approximately 1.61803, otherwise known as the golden ratio. The sequence has a long history. In Europe, it was the solution to a problem of rabbit breeding described in the book *Liber Abaci* by the Italian mathematician Leonardo of Pisa in 1202 A.D. The golden ratio, meanwhile, can be written as one-half of the sum of 1 plus the (6) ……… root of 5. And while phi does not get a pastry-filled holiday like pi, the (7)…. ………. appears in natural phenomena. The numbers of spirals in pinecones are Fibonacci numbers, as is the number of petals in each layer of certain flowers. In spiral-shaped plants, each leaf grows at an angle compared to its predecessor of 360/phi2, and sunflower seeds are packed in a (8) ………. formation in the centre of their flower in a geometry governed by the golden ratio, too.

**Task 3**

**Various parts of the sentences below are underlined. Write questions in which you ask about the underlined part.**

*E.g. I have always admired Chester´s work. (1 point per item; total: 5 points)*

*- Whose work have you always admired?*

1. They completed the survey in May.

…………………………………………………………………..?

1. The evidence gave rise to theories of moving continents.

……………………………………………………………………?

1. The book was first published in London.

…………………………………………………………………… ?

1. They are dealing with some funding-related issues.

……………………………………………………………………. ?

1. She has shared three sets of data with us.

…………………………………………………………………….?

**Task 4**

**Choose the answer that fits each gap.** *(1 point per item; total: 2 points)*

1. I no longer have the support of the team. I have …………. decided to resign.
2. unless b) despite c) therefore d) although
3. We cannot understand the disease …………. we understand the person who has it.
4. unless b) despite c) therefore d) in addition

**Task 5** *(1 point per item; total: 5 points)*

**Use the word given in brackets to form a word that fits in the gap. Do not use -ing forms.**

1. Many species of plants and animals are in danger of …………………… . (EXTINCT)
2. Molten volcanic lava …………….. (SOLID) as it cools.
3. The sea bed ………………… (DEEP) here to 5,000 metres.
4. How can you measure the ………………… (WIDE) of these tiny wires?
5. Many people are very concerned about the ………………. (DESTRUCT) of the rainforests.

**Task 6** *(1 point per item; total: 5 points)*

**Transform the sentences so that they have a similar meaning to the original sentence.**

E.g. They published this book in England.

The book ….. was published in England.

1. We have interviewed 1500 people in the study.

1500 people ………………………………….. in the study.

1. It is a good idea to take the exam this semester.

You ……………………………………the exam this semester.

1. She will consult her supervisor. Then she will submit her dissertation.

She will submit her dissertation after she …………………………… .

1. I haven´t been to Russia for three years.

I last ……………………………. to Russia three years ago.

1. I don´t have enough samples. I can´t complete my study.

I could complete my study if ……………………….. enough samples.

**Task 7** *(1 point per item; total: 7 points)*

**Seven parts of sentences have been removed from the text below. Choose one of parts (A-G) for each gap. Write the appropriate letter next to a number:**

A) going from 0 to 1 means increasing 10 units

B) no matter how high or low you are on it

C) by a certain factor

D) regardless of the location on the line

E) or the intensity of sound waves

F) on the number line

G) but also has a distinct pattern

**Linear versus logarithmic scale**

A **linear scale** is much like the number line. They key to this type of scale is that the value between two consecutive points on the line does not change (1) …………... For instance, (2) ……………, the distance between the numbers 0 and 1 is 1 unit. The same distance of one unit is between the numbers 100 and 101, or -100 and -101. However you look at it, the distance between the points is constant (3) ……………………..

A **logarithmic scale** is much different. On this scale the value between two consecutive points not only changes, (4) ………………...

Imagine that we need to measure a really large quantity of something. Maybe minerals in soil, molecules in air, (5) …………….., for example. Sometimes we need to create a simplified scale where each step represents a large number of units and also increases/decreases (6) ……………….

If a scientist needs to measure billions or even trillions of molecule, they might just make a logarithmic scale with each number (i.e. from 0 to 1) increase representing an increase by a factor of 10. That would mean that (7) ………………….., and going from 0 to 2 means increasing 100 units, because 10^2 = 100. Numbers on a logarithmic scale are representative of a factor increase in real units.

**Task 8** *(1 point per item; total: 7 points)*

**In the text below find seven words that fit the meaning of explanations 1-7. Find only one word for each explanation. The words occur in the text in the same order as their explanations.**

**Euclid and his *Elements***

In the seventeenth century, with new-found confidence, natural philosophers rebuilt all learning from scratch, discarding the wisdom of antiquity as flawed. In that effusion of new investigation, one achievement stood unchallenged. That was Euclid´s Elements. Indeed its premier position was reinforced when the structure it gave to geometrical knowledge was adopted by Newton to codify his new mechanics. Like Euclid, Newton listed definitions and, where Euclid gave axioms, Newton gave his celebrated three laws of motion. Euclid’s Elements became the template for organizing knowledge, be it a new science such as Newton’s or even knowledge outside science.

1. having a defect or imperfection:…………………………

2. observation or study by close examination:……………………

3. something arranged in a definite pattern:……………………………

4. to arrange something into a system:………………………………….

5. statements giving the meaning of words:………………………………..

6. statements accepted as true:………………………………………….

7. movement:…………………………………………………….

**Task 9** *(1 point per item; total: 6 points)*

**Read the text below and decide which answer (A, B, C or D) best fits each gap. There is an example at the beginning.**

**San Francisco: the earthquake of 1906**

At 0512 hours (0) \_\_\_\_\_B\_\_\_\_ the morning of 18 April, the ground began to shake. There were three tremors, (1) \_\_\_\_\_\_\_\_\_ one increasingly more severe. The ground moved by over 6 m in an earthquake (2) \_\_\_\_\_\_\_\_\_ measured 8.2 on the Richter scale. Many apartment buildings collapsed, bridges were destroyed – the Golden Gate had not then been built – and water pipes fractured. The worst damage was “downtown” (3) \_\_\_\_\_\_\_\_\_the housing density was greatest. (4) \_\_\_\_\_\_\_\_\_many people were trapped within collapsed buildings, there were relatively few deaths.

Then came the fire! As it spread, houses were blown up with dynamite to try to create gaps to thwart the flames, but the explosions only (5) \_\_\_\_\_\_\_\_\_further fires. It took over three days to put out the fires, by which time over 450 people (mainly those previously trapped) had died, 28 000 buildings in 500 blocks had been destroyed, and an area six times greater   
(6) \_\_\_\_\_\_\_\_\_that destroyed by the Great Fire of London had been ravaged.

0 A in B on C at D by

1 A each B any C all D most

2 A what B whose C how D which

3 A which B where C that D what

4 A Despite B However C In spite of D Although

5 A lead B contributed C resulted from D caused

6 A as B than C so D so as