Experiment Exam

Research for the COIN seminar at

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Tasks *(50 points, 13 + 2 Minutes)*

1 General Knowledge *(12 points)*

1.1 What is the name of the layer of the atmosphere closest to the Earth? *(1 point)*

☐ a) Stratosphere

☐ b) Mesosphere

☐ c) Troposphere

☐ d) Thermosphere

1.2 How high is the Eiffel Tower? *(1 point)*

☐ a) 150m

☐ b) 176m

☐ c) 220m

☐ d) 300m

1.3 In which year was Michael Jackson born? *(1 point)*

☐ a) 1958

☐ b) 1959

☐ c) 1965

☐ d) 1934

1.4 Who composed "The Magic Flute"? *(1 point)*

☐ a) Joseph Haydn

☐ b) Robert Schumann

☐ c) Johann Sebastian Bach

☐ d) Wolfgang Amadeus Mozart

1.5 Which island is **not part of** the Balearic Islands? *(1 point)*

☐ a) Ibiza

☐ b) Gran Canaria

☐ c) Formentera

☐ d) Cabrera

1.6   To which group of animals are dinosaurs most closely related? *(1 point)*

☐   a) Birds

☐   b) Monkeys

☐   c) Lizards

☐   d) Alligators

1.7   How long is the distance of a marathon? *(1 point)*

☐   a) 10km

☐   b) 12.195km

☐   c) 42.195km

☐   d) 45.195km

1.8   What is the capital of Hungary called? *(1 point)*

☐   a) Budapest

☐   b) Bucharest

☐   c) Zagreb

☐   d) Prague

1.9   The South African state of Zimbabwe became independent in 1980. What was the former name of Zimbabwe? *(2 points)*

Answer: _____

1.10   At the beginning of the 20th century, the Haber-Bosch process was invented. It is an industrial process for producing which chemical compound? *(2 points)*

Answer: _____

2 Mathematics and Logical Thinking *(10 points)*

2.1   A geocacher climbs up a 10 meter long rope. He manages to climb 3 meters in 1 minute. Then he must rest for 1 minute and slides down 2 meters. He does this until he reaches the top. After how many minutes is he at the top of the rope? *(4 points)*

Solution:

2.2   Four geocachers must go through a dark tunnel to reach the geocache. As the tunnel is very narrow, a maximum of 2 people can go through it at the same time. Furthermore, the group has only one flashlight, which is essential for the crossing and must therefore be carried back and forth. The cachers have various levels of fitness and therefore need different lengths of time to cross the tunnel:

Cacher 1 = 1 minute
Cacher 2 = 2 minutes
Cacher 3 = 5 minutes
Cacher 4 = 6 minutes

What is the fastest time (in minutes) for all cachers to get through the tunnel? *(6 points)*

Solution:

3 Everyday Life and Creativity *(18 points)*

3.1 Take a small cart and place 99 smartphones in this cart. All smartphones are switched on and connected to the internet. If you now walk through the city with this cart, what happens? *(3 points)*

Answer: _____

3.2 In 1994, a Denso Wave employee named Masahiro Hara had the idea for **X** while playing the game of Go. In case you have never played Go before: The game consists of a 19×19 grid with black and white stones. What is **X**? *(3 points)*

Answer: _____

3.3 Look at the following Spanish post stamp from 2007:

To which discovery is the motif of the post stamp dedicated? *(4 points)*

Answer: _____

3.4 You are alone on the beach and want to go swimming. You have a baby diaper with you. Explain in detail how the baby diaper can help you in your situation. *(4 points)*

Answer:

3.5   Look at the following picture of a cake mold:

Explain in detail what advantages this cake mold has over conventional ones. *(4 points)*

Answer:

4   Additional Oral Exam *(10 points)*

4.1   Once you have completed your exam, the supervisor will ask you to present one of the tasks from **section 2 or 3.** If you are unable to present the task selected by the supervisor because you have not found a solution, the additional oral exam will be graded with **0 points**. The quality of the presentation is assessed, not the correctness of the solution. You have **exactly 2 minutes** for the presentation. *(10 points)*

Notes: