

MASARYKOVA UNIVERZITA
Centrum jazykového vzdělávání na Přírodovědecké fakultě

JAC03-4 (Angličtina pro chemiky)

Version A

Regular

26 January 2016

NAME:		UČO:
Listening:		Subtotal (33 points out of 55 to pass)
Grammar & Vocabulary:		
Reading:		

LISTENING

(TASK 1)

_____ points

TASK 1

(1 point per item; total: 10 points)

You will hear a climatologist giving a talk on climate. In statements 1 – 8 below fill in the gaps. Use just one word for each gap. You will hear the talk twice:

- Human activities cause _____ to the atmosphere, oceans and composition of the air.
- Therefore, scientists study the _____ of this phenomenon on sea levels, temperature, rainfall, hydrological resources.
- The decisions we make are based on the _____ we have for the climate.
- It seems that the models based on experience are no longer _____.
- We need new information to build _____ for the future.
- Scientists derive their predictions from processes that they can _____.
- Scientists ask what controls the _____ of various climatic events.
- The approach that scientists take is rather _____.
- Scientists combine the small-scale processes in order to predict the emerging _____ of the complex system.
- Many phenomena in the climate are not _____ from the small-scale processes.

GRAMMAR & VOCABULARY

(TASKS 2 – 6) _____ points

TASK 2

(1 point per item; total: 4 points)

Various parts of sentences 11 – 14 below are underlined. Write questions in which you ask about the underlined parts. Keep the structure of the original sentence (including tenses and all semantically important words), the only task is to transform it to a question.

Examples: He is going to write the final part of the thesis next month.

Which part of the thesis is he going to write next month?

11. Zero in questionnaire A corresponds to “disagree strongly”.

_____?

12. The articles published in Science contributed to his fame.

_____?

13. The invited authors’ contributions have resulted in an impressive book.

_____?

14. That student does not interpret his research data appropriately.

_____?

TASK 3

(1 point per item; total: 4 points)

In items 15 – 18, complete a new sentence so that it has a similar meaning to the original sentence(s). The number of words that you should use to complete the new sentence is given in the brackets.

Example: They published this book in England.

The book **was published (2 words)** in England.

15. I was silly to choose that university.

I shouldn’t _____ **(2 words)** that university.

16. “I’ll be prepared for the presentation of the new technologies”, she said to me.

She told me she _____ **(3 words)** for the presentation of the new technologies.

17. Would you like to join us in our qualitative research?

Are you interested _____ **(2 words)** us in our qualitative research?

18. She doesn’t study cartography at the faculty any more. She failed her exams.

She used _____ **(2 words)** cartography at the faculty.

TASK 4

(1 point per item; total: 3 points)

For questions 19 – 21, decide which answer (A, B, C or D) best fits each gap:

19. The experiment did not work well. _____, we decided to repeat it.

A: With reference to B: Provided that C: Despite the fact D: For this reason

20. He used an eight-point scale in the questionnaire, _____ a four-point one, used by me.

A: considering B: consequently C: in spite of D: as opposed to

21. “I think, _____ I am” is a philosophical statement proposed by the French thinker René Descartes.

A: actually B: therefore C: moreover D: even though

TASK 5

(1 point per item; total: 8 points)

Complete gaps 22– 29 in the text below with the following words. There are three words that you will not need to use:

**ACETATE, ACETIC, ACHIEVING, ACIDIC, ACIDITY, CONCENTRATION,
DECOMPOSE, DISSOLVE, NEUTRALIZED, RETAINING, YIELDED**

Buffers

An acid-base combination suitable for controlling pH is known as a buffer. You see the term on bottles of aspirin, meaning that the tablets contain some sort of base to offset the (22) _____ of aspirin. The principal benefit is that such tablets may (23) _____ faster, and thereby go to work faster.

An acid-base buffer is like a shock absorber – something to prevent a disturbance while (24) _____ the original conditions or structure. The control of pH requires maintaining a steady (25) _____ of hydronium ion even when sudden “shocks” of acid or base are added.

The acid in the buffer must react with added base and the base must react with added acid, but at the same time the acid and base components of a buffer must not react with each other. To meet these conditions, buffers are usually mixtures of a weak acid and its weakly basic anion (e.g., (26) _____ acid and (27) _____ ion) or a weak base and its weakly (28) _____ cation (e.g., ammonia and ammonium ion). In the reactions no new substances are produced. The products are always components of the buffer. Both acid and base are (29) _____ by different buffer components to maintain the pH at a constant value.

TASK 6

(1 point per item; total: 6 points)

In sentences 30– 35 below, use the word given in brackets in capital letters to form a word that fits in the gap. Use only one word for each gap. Do not use **-ing** forms:

Example: This **procedure** should be carefully controlled and taken into account. (**PROCEED**)

30. Various statistical _____ showed no significant difference between the two types of sites. (**ANALYSE**)
31. He had no intention of getting drawn into a _____ discussion. (**HYPOTHESIS**)
32. The _____ process can delay the results. (**VERIFY**)
33. In order for the medicine to work _____ you must take the correct amount. (**EFFECTIVITY**)
34. What is an _____ in science? (**ASSUME**)
35. When preparing for a presentation, should I _____ it all? (**MEMORY**)

READING

(TASKS 7 – 9)

_____ points

TASK 7

(1 point per item; total: 5 points)

In the text below find five words that fit the meaning of explanations 36 – 40. Find **only one word** for each explanation. The words occur in the text in the same order as their explanations below the text. An example has been done for you:

Pure drinking water

In spite of all the efforts taken to **purify** public water supplies, many consumers are concerned about the quality of the water that comes out of the taps in their homes, schools, and places of business. Parents of small children are especially worried about chemicals such as lead and carcinogenic organic compounds that are chlorine disinfection by-products. Many have turned to bottled water or home water treatment devices.

The FDA regulates the quality of bottled water. The water passes through one or more purification steps. The three purification methods - distillation, carbon filtration, and reverse osmosis - have already been discussed as (very expensive) methods used for treating municipal water. In the case of bottled water or home water treatment, the cost of treatment is not the major factor because only the small amount of water needed for human consumption needs to be specially purified.

Example: remove impurities from something: **purify**

36. the process of destroying pathogenic microorganisms: _____
37. adjusts to a particular specification or requirement: _____
38. moving or acting in a manner contrary to the usual: _____
39. relating or belonging to the authority of a local government: _____
40. greater than others in importance: _____

TASK 8

(1 point per item; total: 9 points)

Nine parts of sentences have been removed from the text below. Choose one of parts (A – J) for each gap (41 – 49). Write the appropriate letter next to a number, e.g. **57 K**:

- A: that can be washed down the drain
- B: including solid NaOH pellets, flakes, and concentrated solutions
- C: until the flow of water from the drain practically stops
- D: because they can cause rapid breaking of bonds
- E: but if they become diluted
- F: they can be quite harmful to skin and eyes on contact
- G: which can dissolve most mineral scale and iron stains
- H: which have a pH of 12 or higher
- J: so a mat of grease and hair in a clogged drain

Corrosive cleaners

There are some places in the home where really tough cleaning jobs exist. For these jobs, cleaners are formulated with extremes in pH, which allow the acidity or alkalinity of the cleaner to quickly attack the unwanted dirt, grease, or stain.

Toilet-bowl cleaners usually contain hydrochloric acid (41) _____. Other acids, such as phosphoric acid and oxalic acid, are also used in these products. The pH of toilet-bowl cleaners is usually below 2, and because they contain strong acids, (42) _____. They should be handled with extreme caution, and rubber gloves should be worn when using them.

On the other end of the pH scale are drain cleaners (43) _____. These formulations almost always contain the strong base sodium hydroxide. Drains usually clog as a result of oils, grease, and hair caught on rough edges inside the drainpipes. As the foreign matter builds up it becomes more tightly packed (44) _____. The only way to get rid of the material clogging the drain is to dismantle the drain plumbing, use a plumber's "snake," or dissolve the material. Bases like sodium hydroxide are very good at dissolving drain clogs (45) _____ in oils and greases of animal and vegetable origin.

Once the bonds are broken, smaller, more soluble molecules are formed (46) _____. Hair and other proteins are also broken down by sodium hydroxide, (47) _____ will quickly surrender to the action of the strong base. Numerous products containing sodium hydroxide are available, (48) _____. The solutions offer the easiest way to apply the drain cleaner, (49) _____, their effectiveness is diminished.

TASK 9

(1 point per item; total: 6 points)

Read the text and decide which of the options A – D in items 50 – 55 is correct:

We live in an age of constant scientific discovery — a world shaped by revolutionary new technologies. More and more, scientific and technological issues dominate national discourse, from environmental debates on ozone depletion and acid rain, to economic threats from climate change and invasive species. Understanding these debates has become as basic as reading. All citizens need to be scientifically literate to appreciate the world around them and make informed personal choices.

Scientists and educators should be accountable for providing everyone with the background knowledge to help us cope with the fast-paced changes of today and tomorrow. What is scientific literacy and why is it important?

In my opinion, scientific literacy is a mix of concepts, history, and philosophy that help you understand the scientific issues of our time. Scientific literacy is rooted in the most general scientific principles and broad knowledge of science. If you can understand scientific issues in magazines and newspapers then you are scientifically literate.

Admittedly, this definition does not satisfy everyone. Some academics argue that science education should expose students to mathematical rigor and complex vocabulary. They want everyone to experience this taste of “real” science. But I feel strongly that those who insist that everyone must understand science at a deep level are confusing two important but separate aspects of scientific knowledge: doing science and using science. Logically, scientific literacy concerns only the latter.

Interestingly, intense study of a particular field of science does not necessarily make one scientifically literate. Indeed, I am often amazed at the degree to which working scientists are often uninformed in scientific fields outside their own field of professional expertise. I once asked a group of twenty-four Ph.D. physicists and geologists to explain the difference between DNA and RNA. I found only three colleagues who could do so, and they did research in areas where this knowledge was useful. Unfortunately, the education of professional scientists is often just as narrowly focused as the education of any other group of professionals, so scientists are just as likely to be ignorant of scientific matters outside their own specialty as anyone else.

50. According to the author
- A: national debate should be more focused on science.
 - B: scientific issues in magazines are difficult to understand.
 - C: people should participate more in discussing scientific issues.
 - D: scientific literacy is the responsibility of scientists and educators.
51. The definition provided by the author has been
- A: developed by the author himself.
 - B: understood with difficulty.
 - C: accepted by academics / generally accepted.
 - D: taken from mass-media.
52. In the author’s view, the defined term is linked to
- A: using science.
 - B: doing science.
 - C: experiencing real science.
 - D: deep understanding of science.
53. The author believes that
- A: narrow focus of science education is an advantage.
 - B: science education should be more interdisciplinary.
 - C: some aspects of scientific knowledge are confusing.
 - D: studying a scientific field leads to scientific literacy.
54. The majority of the scientists interviewed by the author
- A: demonstrated a high degree of scientific literacy.
 - B: did research in DNA and RNA outside their field.
 - C: found the information about DNA and RNA useful.
 - D: were ignorant of scientific issues outside their specialty.
55. The best title for the text is
- A: Education of professional scientists.
 - B: The level of professional expertise in science.
 - C: What does it mean to be scientifically literate?
 - D: Why is scientific literacy discussed in magazines?

WRITING

(TASK 10)

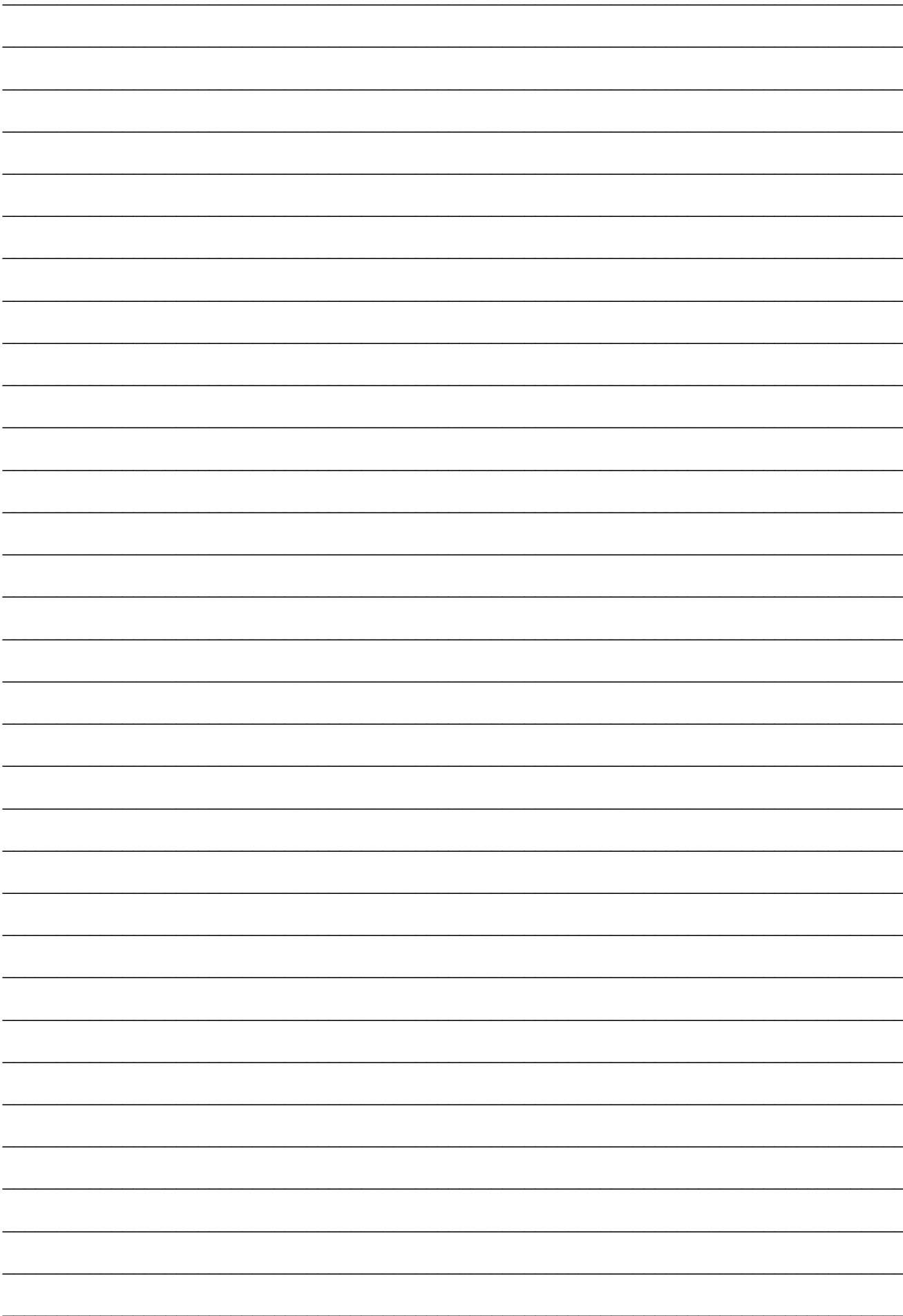
_____ points

TASK 10

(total: 10 points)

Study the information in the table and use it for writing a comparison. Compare all the properties of the two elements. Use a variety of structures to indicate similarities and differences between them. Your writing should have a structure, i.e. opening, main, and closing parts. The purpose is to write this information for readers who are familiar with basic scientific knowledge. (160 words).

	zinc	copper
periodic table classification	transition metal	transition metal
colour	silvery-gray	reddish
density	7.13 g/cc	8.96 g/cc
malleability	100 - 150 °C	room temperature
conductivity	fair	very good
occurrence in human body	trace element	trace element



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Druh termínu

Vyberte datum

KEY

LISTENING

(maximum: 10 points)

TASK 1

(1 point per item; total: 10 points)

Source: <http://edge.org/conversation/the-physics-that-we-know>

Length: 03:54

1. changes
2. impact / impacts
3. expectations
4. valid
5. infrastructure / model
6. measure
7. frequency
8. ambitious
9. properties
10. predictable

GRAMMAR & VOCABULARY

(maximum: 25 points)

TASK 2

(1 point per item; total: 4 points)

11. What does zero in questionnaire A correspond to?
12. What / Which articles / Which of his articles / What articles... contributed to his fame?
13. Whose / Which / Which authors' contributions have resulted in an impressive book?
14. Who / Which student does not interpret his research data appropriately?

TASK 3

(1 point per item; total: 4 points)

15. have chosen / have studied
16. would be prepared
17. in joining
18. to study

TASK 4

(1 point per item; total: 3 points)

19. D
20. D
21. B

TASK 5

(1 point per item; total: 8 points)

Source: Adapted from Joesten M. et al, The world of chemistry. Thompson Brooks/Cole, 2007, pp. 196-197.

Number of words: 210

22. acidity
23. dissolve
24. retaining
25. concentration
26. acetic
27. acetate
28. acidic
29. neutralized

TASK 6

(1 point per item; total: 6 points)

30. analyses
31. hypothetic/al
32. verification
33. effectively
34. assumption
35. memorise/-ze

READING

(maximum: 20 points)

TASK 7

(1 point per item; total: 5 points)

Source: Adapted from Joesten M. et al, The world of chemistry. Thompson Brooks/Cole, 2007, p. 247.

Number of words: 148

36. **disinfection**
37. **regulates**
38. **reverse**
39. **municipal**
40. **major**

TASK 8

(1 point per item; total: 9 points)

Source: Adapted from Joesten M. et al, The world of chemistry. Thompson Brooks/Cole, 2007, p. 198.

Number of words: 331

41. **G**
42. **F**
43. **I**
44. **C**
45. **D**
46. **A**
47. **J**
48. **B**
49. **E**

TASK 9

(1 point per item; total: 6 points)

Source: Adapted and abbreviated from <http://www.actionbioscience.org/newfrontiers/hazen.html>

Number of words: 350

50. **D**
51. **A**
52. **A**
53. **B**
54. **D**
55. **C**