

Шифр:

# ПИСЬМЕННАЯ РАБОТА УЧАСТНИКА ОЛИМПИАДЫ ШКОЛЬНИКОВ СПбГУ 2017–2018

заключительный этап

Предмет (комплекс предметов) Олимпиады

СОВРЕМЕННЫЙ МЕНЕДЖЕР

Город, в котором проводится Олимпиада \_\_\_\_\_

Дата \_\_\_\_\_

\*\*\*\*\*

## Вариант 1

### Математика (Современный менеджер)

Первые 6 задач оцениваются в 3 балла каждая. Остальные по 4 балла.

Часть 1. В задачах 1 – 4 Вам следует обвести в соответствующей графе правильный ответ. (Если Вы случайно выделили не ту клетку, то обведите нужный ответ и напишите его еще раз на полях.)

Задачи		Ответы			
1.	Настя, Миша и Гриша получили одинаковое количество конфет в подарок на Новый Год. В первый день Миша съел конфет меньше всех. Настя съела в два раза больше, а Гриша – в три раза больше, чем Миша. На следующий день Гриша опять съел больше всех конфет, а Настя с Мишей в два раза меньше, чем Гриша. В результате у Насти осталось 8 конфет, а у Миши в 5 раз больше, чем у Гриши. Сколько конфет было в подарке?	8	10	16	18
2.	Вычислите $tg \frac{\pi}{9} \left( \frac{1}{\sin \frac{2\pi}{9}} + \frac{1}{\sin \frac{4\pi}{9}} + \frac{1}{\sin \frac{8\pi}{9}} \right)$	–3	1	2	5
3.	Какое наименьшее число подряд идущих членов арифметической прогрессии 10; 22; 34; .... (не обязательно начиная с первого) надо взять, чтобы их сумма равнялась полному квадрату?	4	2	3	5
4.	Найдите наибольшее значение функции $y = \frac{x(x^2-1)}{(x^2+1)^2}$	$\frac{1}{4}$	0	$-\frac{\sqrt{3}}{3}$	$\frac{1}{3}$

Часть 2. В задачах 5 – 8 следует записать ответ справа от условия задачи (в пустой графе)

5.	Дана окружность с центром в точке $O$ радиусом 6. На хорде $AB$ взята точка $M$ . Через точки $A, O$ и $M$ проведена вторая окружность, пересекающая первую в точке $C$ . Найдите $BM$ , если $AC = 4\sqrt{5}$ , $BC = 4$ .	
6.	Решите уравнение $\sqrt{\frac{2-x^2}{1-x^2}} = x - 1$	

7.	Решите неравенство $\frac{\arccos(3x-1)}{\arcsin x} < 1$ .	
8.	Дан прямоугольный параллелепипед $ABCD A' B' C' D'$ . Точки $M$ и $N$ – середины ребер $AA'$ и $BB'$ . В каком отношении плоскость $MNC' D'$ делит объем пирамиды $B' ACD$ ?	

Часть 3. В задачах 9 – 10 следует справа в соответствующей графе написать ответ, однако дополнительно к этому следует кратко записать решение

9.	При каких значениях параметра $a$ уравнение $\sqrt{x^2 + 2ax - a} + \sqrt{x^2 - a} = a$ имеет решение?	
10.	Решите уравнение $\log_{2x} \frac{x}{2} = \frac{1-x^2}{5-x^2}$	

**Математика, решения заданий 9 и 10:**

## VOCABULARY AND GRAMMAR

### Task 1. Read the text and decide which option (A, B, C or D) best fits each space.

After more than seventy years of television, it might seem only too obvious to conclude that it is (1) \_\_\_\_\_ to stay. There have been many objections to it during this time, of course, and on a variety of grounds. Did it cause eye strain? Did the advertisements contain subliminal (2) \_\_\_\_\_, persuading us to buy more and telling us who to vote for? Did children turn to violence through watching it, either because so many programmes taught them how to shoot, rob, and kill, or because they had to do something to (3) \_\_\_\_\_ the hours they had spent (4) \_\_\_\_\_ to the tiny screen? Or did it simply create a vast passive audience, drugged by glamorous serials and inane situation comedies? On the other hand, did it increase anxiety by (5) \_\_\_\_\_ the news and (6) \_\_\_\_\_ our living rooms with war, famine and political unrest?

- |   |                |            |               |                    |
|---|----------------|------------|---------------|--------------------|
| 1 | A around       | B there    | C ready       | D here             |
| 2 | A information  | B messages | C data        | D communications   |
| 3 | A make up for  | B negate   | C deny        | D compensate       |
| 4 | A attached     | B fixed    | C glued       | D adhered          |
| 5 | A scandalizing | B hyping   | C dramatizing | D sensationalizing |
| 6 | A filling      | B loading  | C stuffing    | D packing          |

### Task 2. Complete each sentence with a suitable preposition.

7. My cousin George is obsessed \_\_\_\_\_ keeping fit.
8. My frozen foods are deficient \_\_\_\_\_ vitamins.
9. They say that there is an exception \_\_\_\_\_ every rule.
10. It was very good \_\_\_\_\_ Sue to drive us to the airport.
11. Breaking his leg put Peter's football career \_\_\_\_\_ jeopardy.
12. The same rule applies, irrespective \_\_\_\_\_ how much you have paid.

### Task 3. For questions 13-16, think of one word only which can be used appropriately in all three sentences. Write ONLY the missing word.

*Here is an example:*

- (0) a) The thief \_\_\_\_\_ the watch into his pocket when he thought no one was looking.  
b) Several visitors to the castle almost \_\_\_\_\_ on the newly polished floor.  
c) The speaker \_\_\_\_\_ a few references to the local football team into his speech, which the audience appreciated greatly.

**Answer:** \_\_\_\_\_ *slipped*

13. a) Throughout the match, Philip \_\_\_\_\_ the ball much harder than his opponent did.  
b) Consumers were badly \_\_\_\_\_ by price increases during the last economic crisis.  
c) It suddenly \_\_\_\_\_ him that today was a public holiday and all the shops would be shut.

**Answer:** \_\_\_\_\_

14. a) The lake is rather \_\_\_\_\_ this winter – we need more rain.  
b) The critics seem to have a pretty \_\_\_\_\_ opinion of his acting skills.  
c) The manager's personal assistant came in to the meeting and spoke to him in a \_\_\_\_\_ voice.

**Answer:** \_\_\_\_\_

15. a) In the future we will be obtaining an increasing amount of \_\_\_\_\_ from wind and water.  
b) He did everything in his \_\_\_\_\_ to find us somewhere to live.  
c) Leaders are often unwilling to give up \_\_\_\_\_, even when they are very old.

**Answer:** \_\_\_\_\_

16. a) The book about wildlife in the Antarctic \_\_\_\_\_ me very deeply and I've been involved in conversation issues ever since I read it.  
b) The politician's speech \_\_\_\_\_ on several topics, but he mainly talked about inner city development.  
c) When Sally \_\_\_\_\_ the painting in the art gallery, all the alarms went off.

**Answer:** \_\_\_\_\_

**Task 4. For questions 17-20, complete the second sentence so that it has a similar meaning to the first sentence, using the word given. Do not change the word given. You must use between TWO and FIVE words, including the word given.**

*Here is an example:*

- (0) Fernanda refused to wear her sister's old dress.

**NOT**

Fernanda said that **SHE WOULD NOT WEAR** her sister's old dress.

17. People believe that he escaped.

**HAVE**

He is \_\_\_\_\_ escaped.

18. I was really pleased that I managed to pass the exam.

**SUCCEDED**

I was really pleased that I \_\_\_\_\_ the exam.

19. .Despite their thorough investigation of the case, the police didn't manage to catch the burglar.

**INVESTIGATED**

Despite \_\_\_\_\_, the police didn't manage to catch the burglar.

20. .Even though we were not old enough, we managed to get into the night club.

**TOO**

Even though we \_\_\_\_\_, we managed to get into the night club.

## READING

### TEXT I

- You are going to read an article in which four people talk about going to the cinema.
- For questions 21-27, choose from the people (A-D).
- The people may be chosen more than once.

#### Which person

- 21 mentions feeling confused at the cinema?
- 22 was persuaded to see a film he didn't enjoy?
- 23 wishes he'd discovered his love of film earlier?
- 24 wanted to research something thoroughly?
- 25 hopes he will be able to turn his interest into a job?
- 26 regrets taking something for granted?
- 27 states a preference for film over other media?

### GOING TO THE CINEMA

*Four people talk about their experiences of going to see films at the cinema.*

#### A Jonathan

My family went to the cinema every Saturday when I was a child. My parents both worked long hours, so we didn't see much of each other during the week, and going to the local Picture Palace meant a great deal to all of us. The habit stayed with me as I got older, and although I'm a great reader, and a fan of the arts in general, nothing comes close to the feeling I get when I'm fully absorbed in a film. That's not to say I'll watch anything, in fact I'm very critical of bad movies, I saw something just recently I wanted to walk out of, but had to sit through it to the end as a good friend of mine had talked me into going, and was laughing all the way through. When he asked me afterwards what I'd thought about it, I had to choose my words carefully!

#### B Ivan

Even though I've always loved films, I never went to the cinema much when I was younger – I preferred watching TV with my friends. There used to be three cinemas in the town I grew up in, and I suppose I just thought they'd always be there. They're long gone, of course, replaced by blocks of flats, and now I wish I'd been more often. These days, the nearest cinema is half an hour's drive away from my home. I go as often as I can, because watching a film on a big screen is the only way to truly appreciate it, in my opinion. I took a film studies course in my first year at university, because I'd decided to learn about the cinema industry in depth, and at that time I thought I might like to become a producer myself one day. I'm actually working in the music industry now!

#### C Liam

My interest in films dates back to a visit to the cinema with my father when I was about nine. We didn't go very often, tending to watch things like nature documentaries on TV at home. He'd picked the film and thought I'd like it because it was a spy drama, which I did, even though I hadn't really got a clue what was going on. There was something wonderful about the sense of occasion, and the thrill of watching a film in a crowd of other people. I was hooked. It also turned out that one of the actors lived in the next street to us, and I'd often seen him in our neighbourhood. I'd never had a clue who he was before then and was very impressed. A few years later, I started writing a film blog, and I'd like to make a living as a film critic one day.

#### D Simon

My parents rarely went to the cinema, so it was only as a teenager that I started going to the cinema with my friends, and realised what I'd been missing. Sadly, I'll never make up for losing out on the magic of seeing things on the big screen as a young child, but have done my best to make up for it ever since! I got

a summer job in our local cinema, which I absolutely loved, because apart from selling tickets, I could see films for free. Then the manager asked me if I'd like to work at a week-long film festival in a neighbouring town. I met all sorts of amazing people with similar interests to mine, and a group of us ended up running our own independent film festival a few years later.

## TEXT II

**Read the following article about a teenager who runs his own chocolate-making business. For each question (28-33), choose one letter (A, B, C or D).**

Think teenagers, think couch potatoes eating pizzas out of the box or munching 99p burgers? Think again because there's a new teenager in town and he's on a chocolate-coated mission! Louis Barnett runs a rapidly-growing chocolate empire which counts among its customers the British supermarket chains Waitrose and Sainsbury's, as well as upmarket department stores in London, New York and as far away as Moscow. All this and Louis is still only eighteen.

But things weren't always that easy. Despite an IQ of 132, Louis dropped out of school when he was only eleven, frustrated and disheartened. 'It was terribly difficult for him,' his mother Mary explains. 'His handwriting was really bad and he struggled with spelling.' The problem was that Louis was, in his own words, 'dyslexic, dyspraxic and dyscalculic'. Nothing the school system had to offer made any sense to him.

So, with the help of his parents and a specialised tutor, Louis set about a vocational-based, home-study programme concentrating on the thing that he loved most: chocolate. 'I'd always been intrigued by it,' says Louis, who bought his first Belgian chocolates with his own pocket money when he was only nine. By the time he was thirteen he had already created his own line of specialist chocolates, a sample of which he sent to Waitrose head office.

'It was slightly bizarre,' admits Waitrose chocolate buyer, Greg Sehringer. 'One day a package arrived in reception addressed to the confectionary buyer. It spent a day or so in the post room before finding its way to me but as soon as I saw the product, I thought it was great. So we arranged to meet Louis and he arrived here a few days later – with his parents. We didn't expect **that**.' But don't think this is a case of pushy parents, Sehringer says. Louis did the talking.

The product Louis sent to Waitrose was a box made of chocolate. 'One Christmas I decided to make some chocolates for my family and friends to send as presents but when I looked into packaging I found that it was more expensive than the chocolate inside. So I thought, 'Why not make a chocolate box to put the chocolates in?' He then gained a qualification in chocolate making from the prestigious Zurich-based Callebaut Academy, the youngest person ever to do so. They in fact sponsored the rest of his chocolate-making education. His grandparents also helped out, lending him the money for a special chocolate temperature-regulating machine. Once he had that, Louis was **off and running**. By the age of sixteen he was selling chocolates to luxury department stores in both the UK and the USA. His company, called Chokolit because this is how Louis as a dyslexic spells chocolate, was very much on the map.

Louis calls himself an ethical chocolatier and includes pictures of endangered species on the packaging of his new range of palm oil-free chocolate bars, a percentage of the sales of which go to animal charities. Waitrose ordered 100,000 boxes of the bars in 2007 and Louis then had to move production from his parents' garage to a factory in the north of England. Louis still lives with his parents, both of whom work for his business, as does his girlfriend Sally, who is his PA. There have been a few problems finding the right staff, though, because some people are reluctant to take orders from a teenager.

As for dealing with the interest from the press and becoming a chocolate maker to the rich and famous, Louis is undaunted. 'What we've done so far is monumental,' he says, 'but I don't want to lose control of the business.' In fact, Louis is already thinking about how he can use the attention he is getting to encourage young people to get into cooking.

- 28 Why did Louis Barnett leave school?
- A He wanted to try something new.
  - B The teachers didn't understand him.
  - C He had special problems.
  - D He kept failing spelling tests.
- 29 How did Louis's parents react to his problems?
- A They were very worried about their son.
  - B They understood his needs.
  - C They paid a private teacher to help him.
  - D They blamed the school system for his failure.
- 30 What does *that* in paragraph 4 refer to?
- A That they would receive a package in the post.
  - B That they would actually meet Louis.
  - C That Louis would be with his parents.
  - D That Louis would arrive late.
- 31 What does the phrase *off and running* in paragraph 5 mean?
- A trying to escape
  - B competing in a race
  - C moving quickly
  - D progressing well
- 32 Why did Louis stop making his chocolates in his parents' garage?
- A The demand for his chocolates had grown.
  - B He wanted to make chocolates using ethical principles.
  - C He found it difficult to work with his parents.
  - D He wanted to move in with his girlfriend.
- 33 How does Louis feel about his company?
- A He is proud of it but would not like anyone else to run it.
  - B He would like to specialise in making chocolates for celebrities.
  - C He is worried that it might be getting out of control.
  - D He thinks it is not getting enough attention.

## Обществознание (Современный менеджер)

1. Приведите три примера преимуществ организации бизнеса в форме акционерного общества (АО).

2. Установите соответствие между видами издержек и затратами фирмы: к каждой позиции, данной в первом столбце, подберите соответствующую позицию из второго столбца.

Затраты фирмы	Вид
А) арендная плата за здание	1. постоянные
Б) расходы на упаковочный материал	2. переменные
В) заработная плата бухгалтера	
Г) сдельная зарплата рабочих	
Д) расходы на перевозку продукции	

Запишите в таблицу выбранные цифры под соответствующими буквами

А	Б	В	Г	Д

3. Агрокомбинат выращивает в теплицах овощи и зелень. К капиталу фирмы относятся (относится):

- а) работники теплиц;
- б) оборудование теплиц;
- в) земля под теплицами;
- г) руководство агрокомбината.

4. Запишите слово, пропущенное в таблице.

Процесс	Подсудные дела
Уголовный	Изобличение преступников, предание их суду, назначение наказания
...	Исковые дела по спорам, возникающим из семейных правоотношений

5. На фондовом рынке происходит

- а) взаимодействие непосредственных производителей продукции;
- б) купля-продажа ранее выпущенных активов;
- в) оборот товаров сельскохозяйственного назначения;
- г) покупка и продажа недвижимости.

6. Для какой общности характерны следующие черты: особенности языка, культуры, единая историческая память?

- а) профессиональной;
- б) территориальной;
- в) демографической;
- г) этнической.

7. Найдите в приведенном ниже списке средства массовой коммуникации, возникшие в XX в.

- а) кинематограф;
- б) Интернет;
- в) телевидение;
- г) газеты;
- д) радио.

8. Гражданин Н. закончил курс основ предпринимательства и решил основать собственное частное индивидуальное предприятие, заняться разработкой сайтов. Выберите в приведённом ниже списке преимущества подобной формы бизнеса.

- а) лёгкость получения банковских кредитов;
- б) высокая степень сохранности коммерческой информации;
- в) простота организации и управления;
- г) не надо делиться прибылью с совладельцами;
- д) достаточно средств для рекламной кампании;
- е) возможность привлечь высококлассных специалистов.