BOCCONI UNIVERSITY

Practice test

International 1.20

INSTRUCTIONS

The test is made up of multiple choice questions of various kinds; for each question there are five possible answers, of which you must choose *one only* which you consider to be correct. This booklet contains the questions. You must mark your answers on the *answer sheet*, which is at the end of this booklet. Mark your answers by blacking out (■) the corresponding box on the *answer sheet*. Warning*: you must not mark the answers on this booklet*, but on the *answer sheet* provided. On the *answer sheet*, you must only black out (■) the boxes corresponding to your chosen answers; do not make any other marks on the sheet. To make sure that you compile the *answer sheet* correctly, carefully read the instructions on the sheet itself. At the end of the test, check your answers with the "Scoring key" provided in the last page of this booklet.

Now start the test.

---

1. If point (1,0) is the vertex of a parabola with equation $y = ax^2 + bx + c$ which passes through point (0,1), then the parabola passes also through point:
   1. (2,2)
   2. (2,3)
   3. (3,2)
   4. (3,3)
   5. (3,4)

---

2. During a target-shooting competition, Antonio hit 51 targets out of 60. Which percentage of targets did he hit?
   1. 95%
   2. 90%
   3. 80%
   4. 85%
   5. 70%

Read the passage below and use the information to answer the next question

World Wide, the technical potential to increase energy efficiency is considerable; in the next two or three decades, saving between 10 and 30% could be done at a **negative cost** - i.e. with an economical benefit of the investors all around the world (including areas where Italian companies do operate) – simply by intervening on energy conservation and handling the demand.

3. By "negative cost" they mean:
   1. an unprofitable investment
   2. a benefit for the investor
   3. the cost which environment will suffer because of a certain activity
   4. the cost which the community will suffer because of a certain activity
   5. the deficit of a country

---

4. A given population decreases by 20% every year. What is the approximate percentage left after 5 years?
   1. 0%
   2. 10%
   3. 20%
   4. 30%
   5. 50%

Reply to the next question referring also to the table below

Number of cars sold in Italy (2019)*

Country of origin	MPV	Family	Utility	Saloon	4x4	Coupé	SUV
Italy	62	48	86	56	15	17	10
France	45	52	68	63	8	19	4
Germany	32	43	56	52	6	3	9
USA	36	28	18	11	32	19	6
Japan	27	15	75	53	6	8	48
China	14	11	15	22	3	5	18

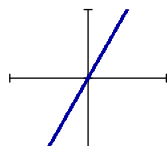* The figures are expressed in thousands

5. Italian marques outdid French marques for how many car types sold in Italy in 2019?
   1. 2
   2. 3
   3. 4
   4. 5
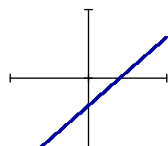   **5.** It is not possible to answer on the basis of the data provided

6. Three men were given a work with an hourly wage of €125, €150 and €175 respectively. At the end of the work the total amount they received was €108,000. If they worked 8 hours a day for five days a week, how many weeks did it took them to do that work?
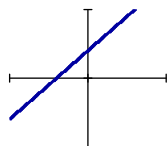1. 7
2. 4
3. 5
4. 6
5. 8

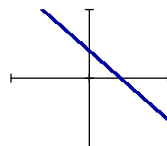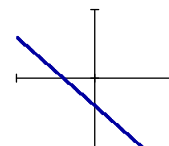**7.** Which of the following lines has an equation $2x + 3y = 4$?

1.	**2.**	**3.**	**4.**	**5.**

Read the passage below and use the information to answer the next question

Among actual advantages that companies and organizations may gain thanks to electronic commerce (EC) are: a global presence, as an inborn characteristic of the Internet; better quality for the service thanks to a prompt contact with the customers and the possibility to answer to their questions very quickly; custom-made goods offered at a limited price, because in some sectors direct contact makes it possible to produce customized goods at the same cost of "mass" production; cutting on the supply chain, lowering the end price and even gaining greater negotiation power against the distribution; cost saving; new product-market opportunities as new kinds of service may be needed or some goods may be offered in markets which were previously difficult to reach.

8. In some sectors, direct contact with the customer:
1. causes the redundancy of work-force
2. causes a reduction of the company's profit margin
3. makes it possible to automate commercial transactions
4. makes it possible to manufacture custom-made goods at low cost
5. is a source of stress for employees

9. "For the approval of a new plan is sufficient, but not necessary, the signature of the CEO (Chief Executive Officer) of the company". If this is true, it will of course be true that:
1. a new plan cannot be approved until it hasn't been signed by the CEO
2. before a new plan is approved the CEO must necessarily sign it
3. it's possible that a new plan is approved without the CEO's signature
4. if the CEO's signature is missing a new plan cannot be approved
5. none of these

10. Which is the best calculation of the base 2 logarithm of 8,000?
1. 40
2. 13
3. 4
4. 10
5. 16

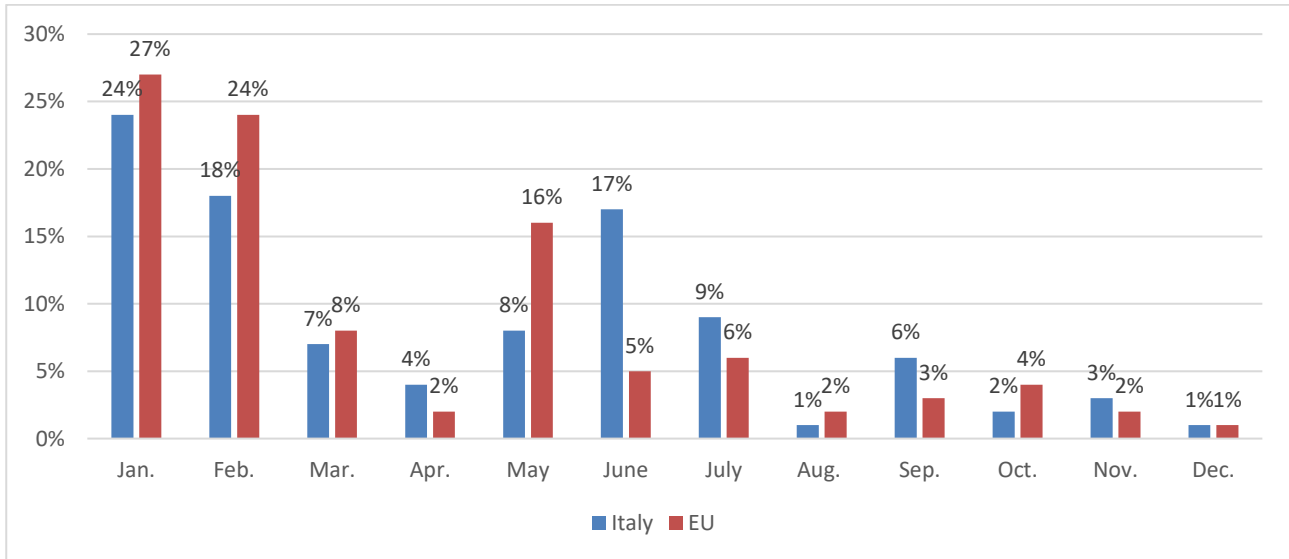**Read the passage below and use the information to answer the next question**

Today, the expression "electronic commerce" (EC) tends to assume a particular meaning in relation to the development on a planetary scale of telecommunication networks, thus distinguishing the realisation of a new channel with which companies can take advantage of new ways of making commercial contact with its suppliers and clients. And so one may think of a technology that leads to a radical change of our habits, comparable with the advent of television as far as speed and broadcast range are concerned. Object of the exchange are goods, services, certifications and information, whereas the principals are private citizens, companies and public institutions.

11. The expression EC represents:
1. an electronics centre
2. a transaction of a commercial nature
3. a telecommunications network
4. an obsolete technology
5. a future technology

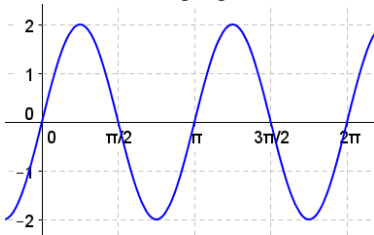**Reply to the next question referring also to the graph below**

Car sales in Italy and EU (year 2019)

12. The biggest percentage of car purchases in 2019, in both Italy and the EU, was made in the:
   1. 1st quarter
   2. 2nd quarter
   3. 3rd quarter
   4. 4th quarter
   5. it is not possible to answer on the basis of the data provided

13. The following figure shows the graph of the function $f(x) =$

   1. $2\sin(x/2)$
   2. $\sin(2x)/2$
   3. $2\sin(2x)$
   4. $\sin(2x)$
   5. $2\sin(x)$

14. Mathematics and Computer Studies are taught on a course attended by 30 students: 24 students attend the Computer Studies course and 16 attend the Mathematics course. How many students study both subjects?
   1. 6
   2. 14
   3. 10
   4. 12
   5. The data are insufficient to provide an answer

Read the passage below and use the information to answer the next question

According to the IPCC, a panel for studying and fighting against pollution, from now to 2100 the world commercial energy system will be replaced at least twice. This will be an advantage for far-seeing countries which will replace their system for producing, carrying and using energy without untimely replacing the invested capitals, too. Such manoeuvre would allow to intervene at the end of the economic life of plants and machinery, thus highly or totally reducing the economic costs for a community who wish and need to limit climate-changing gas emissions.

15. Why can the renewal of the world commercial energy system be an advantage for the environment?
   1. Because it will allow for the reduction of the number of plants and polluting operations
   2. Because it will cut the investment of capitals from plants and polluting operations
   3. Because it will allow to establish the new plants in already-degraded locations
   4. Because it will allow to build new plants and develop less and less polluting operations
   5. None of the above statements is correct

16. Tobacco blend no. 1 of a certain brand contains twice as much Virginia and 1/3 of the Havana as blend no. 2. Both blends contain 60% of other tobaccos. What is the percentage of Virginia in blend no. 1?
1. 30%
2. 32%
3. 48%
4. 50%
5. 52%

17. Let us assume a quadratic equation with variable x: $ax^2 + bx + c = 0$. If $a < 0$ and $c < 0$, how many different real solutions does the equation have?
1. 0
2. 1
3. 2
4. Infinite
5. Data are not enough to answer

Read the passage below and use the information to answer the next question

The State forcedly and unilaterally levies taxes on the citizens so as to found its activity. The State withdraws a part of the citizens' income through taxation. Direct tax affects personal income and property, because owners directly show their ability to pay tax. Indirect tax affects wealth transfers and consumption.

18. The citizens' income:
1. is checked by the Financial Police every year
2. is almost always increased by State contributions
3. is almost entirely absorbed by indirect tax
4. suffers from a partial withdrawn by the State administration
5. none of the above statements is correct

19. It is known that $f(x) = 3x + b$ with $f(8) = 21$. How much is $f(12)$?
1. 9
2. 24
3. 25
4. 33
5. Data are not enough to answer

20. Imagine that the following frequencies of linguistic disorder and psychotic trait have been identified within a study of 250 patients in a psychiatric hospital:

		Psychotic trait	
		Present	**Absent**
Linguistic	**Present**	160	40
disorder	**Absent**	40	10

Which of the four cells should be considered to determine whether or not there is a statistical link between linguistic disorder and psychotic trait?
1. The top left cell and the top right cell
2. The bottom left cell and the bottom right cell
3. The top left cell and the bottom right cell
4. The top right cell and the bottom left cell
5. All four cells

Read the passage below and use the information to answer the next question

The usage of electronic commerce is growing at an impressive rate, which is mainly related to the widespread of the Internet. Research by various sources shows that the number of "Internet surfers" was about 100 million people at the beginning of 2005, and should get to 250 million in 2007. The gap between the spread of the Internet in the USA and in Europe is quickly reducing, and indeed new websites are now being created in Europe three times as fast as in the USA.

21. How is the growth rate of electronic commerce defined as in the passage?
1. Average
2. Slow
3. Insignificant
4. Considerable
5. It is not dealt with in the passage

22. There are 260 quintals of salt stored in the warehouse of AQ Ltd., a company that distributes sea salt, but as a result of evaporation, in 5 days the amount is reduced by 325 kilos. What is the percentage of the reduction?
1. 8.5%
2. 11%
3. 4.3%
4. 1.25%
5. 3%

Reply to the next question referring also to the table below

Information searched for by WAP mobile phones (connections)

	Morning	*Afternoon*	*Evening*	*TOT.*
Tourist Information	410	182	53	645
Weather	280	390	190	860
Games	205	332	370	907
Sports Information	360	228	405	993
Horoscope	120	160	148	428
Financial Information	325	108	34	467
TOT.	1,700	1,400	1,200	4,300

23. In descending order, which information is the most sought after on WAP mobile phones in the morning?
1. Tourist, sports, financial
2. Horoscope, weather, games
3. Financial, horoscope, sports
4. Weather, tourist, horoscope
5. Weather, horoscope, sports

24. If the base a logarithm of b is 0.5, then:
1. $a^2 = b$
2. $b^2 = a$
3. $\sqrt{a} = b$
4. $\sqrt{b} = a$
5. $0.5^a = b$

25. What does the product of the square of $2a$ and the reciprocal of the opposite of $2b$ equal?
1. $16a^2b^2$
2. $4ab^2$
3. $-2\dfrac{a^2}{b}$
4. $16a^2b$
5. $-4a^2b$

BOCCONI UNIVERSITY

ANSWER SHEET

INSTRUCTIONS

Do not fill in the box corresponding to your answer until you are sure of it. Fill in the box fully and correctly as shown below. Do not use other marks.

1	2	3	4	5
■	⊠	⊘	⊡	⊕
yes	no	no	no	no

If you want to change your answer, fill in fully the box corresponding to your new choice on the bottom line as shown below:

↑_____ **This is the correct answer**

In this way any answer on the top line is considered as cancelled.

To cancel your choice, fill in fully any other box on the top or on the bottom line as shown below:

QUESTION	CORRECT ANSWER	AREA
1	5	Mathematics
2	4	Logical Reasoning
3	2	Text Comprehension
4	4	Mathematics
5	3	Numerical Reasoning
6	4	Logical Reasoning
7	4	Mathematics
8	4	Text Comprehension
9	3	Logical Reasoning
10	2	Mathematics
11	2	Text Comprehension
12	1	Numerical Reasoning
13	3	Mathematics
14	3	Logical Reasoning
15	4	Text Comprehension
16	2	Logical Reasoning
17	5	Mathematics
18	4	Text Comprehension
19	4	Mathematics
20	5	Logical Reasoning
21	4	Text Comprehension
22	4	Logical Reasoning
23	1	Numerical Reasoning
24	3	Mathematics
25	3	Logical Reasoning