# CA' FOSCARI UNIVERSITY OF VENICE Degree in Business Administration - Economics and Management (curriculum Economics and Management) <br> UNIVERSITY OF TRIESTE <br> Degree in Economics, International Trade and Financial Markets (curriculum in Economics of Financial and Insurance Markets and Economics and Management of Innovation) <br> <br> QUESTIONNAIRE 

 <br> <br> QUESTIONNAIRE}

DO NOT OPEN
the plastic envelope until you are told the test is starting

1. Working at the same rate, 6 workers can produce a total of $\mathbf{2 7 0}$ toys per minute. At this rate, how many toys could 10 workers produce in 240 seconds?
A. 450
-B. 1800
C. 2700
D. 1080
2. A video rental shop has 75 DVDs available for renting, all of which were in the shop at the beginning of the week. If by the end of the week $65 \%$ of DVDs that were loaned are returned and there are 68 DVDs in the shop, how many DVDs were loaned during the week?
-A. 20
B. 30
C. 35
D. 40
3. If a number $x$ is divided by another number $y$ the result is $2 / 3$. If $y$ is divided by $z$ the result is $4 / 7$. If $x$ is divided by $z$ the result is?
-A. $8 / 21$
B. $3 / 4$
C. $7 / 21$
D. $7 / 8$
4. In the first month of 2000 , Jessica saved $1 \subset$. In each of the following 51 months, she saved $1 \subset$ more than she had saved in the previous month. What was the total amount that Jessica saved during the 52 months?
A. $1352 €$
-B. $1378 €$
C. $2652 €$
D. $1326 €$
5. A total of $x$ cans and bottles are stored in a drawer. If the number of bottles is $1 / 4$ the number of cans, and $2 / 3$ of the cans are empty, how many empty cans, in terms of $x$, are stored in the drawer?
A. $\frac{x}{6}$
B. $\frac{5}{12} x$
C. $\frac{x}{2}$
-D. $\frac{8}{15} x$
6. Select the sum of all 3 digit positive integers that can be obtained with the digits $1,5,8$, assuming that the digits are not allowed to repeat within the number:
A. 1491
B. 308
-C. 3108
D. 13986
7. Assuming that $a$ and $b$ are two not equal prime numbers greater than 1 , which of the following is the smallest possible value of their sum?
A. 3
B. 4
-C. 5
D. 8
8. Of a group of housewives, $78 \%$ said that they use a tablet at home, $\mathbf{6 5 \%}$ said that they use it outside, and $52 \%$ that they use it both at home and outside. How many housewives do not use a tablet at all?
-A. $9 \%$
B. $11 \%$
C. $39 \%$
D. $26 \%$
9. Janet has 10 pairs of earrings. After losing 7 earrings, what is the maximum number of pairs of matched earrings she can have?
A. 3
B. 4
C. 5
-D. 6
10. 1000 workers are paid $5 € / h$ for the first 40 hours worked during a month and 1,5 times that rate for the subsequent hours. What was the total payroll for a month in which $\mathbf{3 0 \%}$ of the workers worked $\mathbf{2 0}$ hours, $\mathbf{5 0 \%}$ worked 40 hours, and the rest worked 50 hours?
A. $180.000 €$
-B. $185.000 €$
C. $190.000 €$
D. $200.000 €$
11. Complete the following sequence of numbers: 1-4-10-22-46-...
A. 84
B. 92
-C. 94
D. 96
12. In the multiplication grid below, $a, b, c$ and $d$ are integers. What does $d$ equal?

|  | $c$ | $d$ |
| :---: | :---: | :---: |
| $a$ | 21 | 24 |
| $b$ | 77 | 88 |

A. 22
B. 11
-C. 8
D. 12
13. If book $=20$, problem $=35$, ace $=15$; then friend $=$ ?
-A. 30
B. 20
C. 35
D. 40
14. Alex, Bertha, Charlie, David, Elena, Frankie and Gemma are all members of the same family consisting of three children, two of whom, Frankie and Gemma are girls. No other assumption of gender based on name can be established. There are also four adults. Alex is a doctor and his brother is David. One of them is married to Elena, and they have two children. Bertha is married to David and Gemma is their child. Who is Charlie?
A. Alex's daughter
B. Frankie's daughter
C. Gemma's brother
-D. Elena's son
15. If John loses 8 kg , he will weigh twice as much as his friend Mark. Together they weigh 278 kg. What is John's current weight, in kg?
A. 131
B. 135
C. 139
-D. 188
16. If $a$ authors can write a book in d days, then how many days will it take $(a+x)$ authors to do the job if all the authors work at the same pace?
-A. $\frac{d a}{x+a}$
B. $\frac{x+a}{d}$
C. $\frac{x+a}{d a}$
D. $\frac{d}{x+a}$
17. All Florentines are Italian, all Tuscans are Italian, therefore, assuming that every group has at least one member, the previous assertions imply:
A. All Florentines are Tuscans
-B. Some Florentine is Italian
C. No Florentine is Tuscan
D. All the other answers are wrong
18. There are 8 books on a table; 4 are fiction books and the other 4 are non fiction books. If 3 books are selected at random, the probability that at least one fiction book will be selected is?
A. $1 / 2$
B. $2 / 3$
C. $32 / 35$
-D. $13 / 14$
19. According to the figure below, indicate the diagram that represents the relations between the sets: lawyers, nice people, football followers.


1


2


3


4


5


6


7
-A. 5
B. 1
C. 2
D. 7
20. Considering two sets $A$ and $B$, if $A \cup B=A \cap B$, then:
A. $A=\varnothing$
B. $B=\varnothing$
-C. $A=B$
D. All the other answers are wrong
21. If $W$ is an infinite set and $W_{1}, W_{2}, W_{3}, \ldots, W_{n}$ are sets such that $W_{1} \cup W_{2} \cup W_{3} \cup \ldots W_{n}=W$ then:
A. There is at least one finite $\mathrm{W}_{\mathrm{i}}$ set
B. There cannot be more than one finite set
-C. There is at least one infinite $W_{i}$ set
D. All the other answers are wrong
22. If $A=[-1,7[, B=]-\infty, 15 / 2]$ and $C=[7,8]$ then it is true that:
-A. $A \cap C=\varnothing$
B. $A \cap B=[-1,7]$
C. $B \cap C=[7,15 / 2]$
D. $A \cap C=[-1,8]$
23. Which of the following are empty sets?

$$
X=\{x \mid x=9,2 x=4\} ; Y=\{x \mid x<x\} ; Z=\{x \mid x-8=4\}
$$

-A. $X$ and $Y$ only
B. All $X, Y, Z$
C. $X$ and $Z$ only
D. $Y$ and $Z$ only
24. If $a$ is not equal to 0 and $a^{2}=4 a b-4 b^{2}$ then $a$ in terms of $b$ is equal to?
-A. $2 b$
B. $b$
C. $b / 2$
D. $-2 b$
25. The value of the following expression is:

$$
(\sqrt{2 \sqrt{2}+3}+\sqrt{3-2 \sqrt{2}})^{2}
$$

A. 5
B. 6
C. 7
-D. 8
26. If $x$ is the least common multiple of 90,28 and 36 , which of the following numbers does not divide $x$ ?
-A. 8
B. 7
C. 6
D. 5
27. What is the result of:
$\frac{14}{4} \div \frac{7}{32}$
-A. 16
B. $7 / 20$
C. $3 / 20$
D. $49 / 64$
28. If an integer is divisible by both 6 and 8 , then it must also be divisible by?
A. 10
B. 14
C. 18
-D. 12
29. Which of the following expressions is equivalent to: $3 x^{2}+2 x-8$
A. $(3 x-4)(x-2)$
-B. $(3 x-4)(x+2)$
C. $(3 x-2)(x+4)$
D. All the other answers are wrong
30. Determine the degree of the following polynomial: $23 a^{4} b^{5}+17 a^{3} b-a^{8}+a b^{9}$
A. 9
-B. 10
C. 3
D. 8
31. Simplify the following expression: $(4 a+2 b)-(2 a-3 b)-(a-b)$
A. $6 a+6 b$
-B. $a+6 b$
C. $-2 b$
D. 6 b
32. How many different groups of $\mathbf{3}$ members can be formed from $\mathbf{6}$ men?
-A. 20
B. 120
C. 18
D. 6 !
33. The solution of the following equation is: $2(x-3)+0.7 x=3+0.2 x$
A. $-6 / 5$
-B. $18 / 5$
C. $90 / 29$
D. 3
34. Solve for $b$, when $a \neq 0$, the equation $a b-d=c$
A. $\quad b=\frac{c-d}{a}$
B. $\quad b=c+d-a$
C. $a b=c+d$
-D. $b=\frac{c+d}{a}$
35. The solutions of the following system are:
$\left\{\begin{array}{l}x^{2}+4 x+3=0 \\ y=2 x+6\end{array}\right.$
A. $(1,8)$ and $(3,0)$
B. $(-1,4)$ and $(3,0)$
-C. $(-1,4)$ and $(-3,0)$
D. $(1,-8)$ and $(-3,0)$
36. Solve for $x$ the inequality $\left(x^{2}-36\right)^{2}<0$
A. $\{6\}$
B. $\{-6\}$
-C. The inequality has no real solution
D. $\{-6,6\}$
37. Which values of $x$ solve

$$
\sqrt{2 x+1}=-3
$$

-A. No value
B. 4
C. 1
D. 0
38. Solve the following inequality: $\boldsymbol{x}^{\mathbf{2}} \mathbf{- 4 x - 2 1 \leq 0}$
A. $[7, \infty)$
B. $(-\infty,-3]$
C. $(-\infty,-3] \cup[7, \infty)$
-D. $[-3,7]$
39. Solve the following inequality:

$$
\frac{4+x^{2}}{x+10}>0
$$

A. $(-\infty, 10)$
B. $(-10,-2) \cup(2,+\infty)$
-C. $(-10,+\infty)$
D. $[10,+\infty)$
40. Match the following graph with the correct equation:

-A. $y=\frac{3}{2} x-2$
B. $y=\frac{3}{2} x+1.3$
c. $y=3 x-2$
D. $y=-2 x+\frac{3}{2}$
41. Select the graph that represents the curve of equation $(x+1)^{2}+(y-3)^{2}=4$
-A.

B.

C.

D.

42. Which of the following equations does not represent a function of $\boldsymbol{x}$ ?
A. $y=2 x$
B. $y=\frac{x+2}{x+1}$
c. $y x=10$
-D. $x^{2}+y^{2}=95$
43. Which of the following parabolas does not cross the x -axis?
A. $y=x^{2}+4 x+4$
-B. $y=x^{2}+4 x+5$
C. $y=-x^{2}+4 x+5$
D. $y=4 \bar{x}^{2}+x$
44. Richard and Caroline sold paintings for a charity project. Richard sold 4 more than half the paintings sold by Caroline. Which equation represents the number of paintings sold by Caroline in terms of the number sold by Richard?
A. $c=\frac{r}{2}+4$
-B. $c=2 r-8$
C. $c=2 r+8$
D. $c=2 r-4$
45. A team of 12 players scored 100 points in a quiz game. If the minimum points scored by a single player is 7 , what is the maximum number of points that a single player might have scored?
-A. 23
B. 21
C. 16
D. 13

