

**CA' FOSCARI UNIVERSITY OF VENICE**

Degree in Business Administration - Economics and Management (curriculum Economics and Management)

**UNIVERSITY OF TRIESTE**

Degree in Economics, International Trade and Financial Markets (curriculum in Economics of Financial and Insurance Markets and Economics and Management of Innovation)

**QUESTIONNAIRE**

**DO NOT OPEN**

the plastic envelope until you are told  
the test is starting



Prova P00001

1. **It's wrong to affirm that it's not true that some cat is not four-legged. If this sentence is true, it follows that:**
- X A. there is at least one cat that isn't four-legged  
 B. no cats are four-legged  
 C. no cats aren't four-legged  
 D. there is at least one four-legged cat
2. **During a meeting, 10 businessmen agree that each of them will write a reference for every member of the group who has had a higher turnover than themselves over the previous year. If none of the businessmen had the same turnover, how many references are written?**
- X A. 10  
 B. 30  
 C. 45  
 D. 55

Answer the following two questions in accordance with the table below, which provides a breakdown of spending patterns in relation to annual family income.

INCOME BRACKETS	ANNUAL INCOME	BREAKDOWN OF SPENDING				
		FOOD	HOUSING	CLOTHING	HEALTH	OTHER
1st	from € 12,000 to € 20,000	36%	32%	8%	14%	10%
2nd	from € 20,001 to € 28,000	32%	34%	10%	16%	8%
3rd	from € 28,001 to € 36,000	40%	26%	14%	12%	8%
4th	from € 36,001 to € 44000	41%	22%	12%	20%	5%

3. **A family belonging to the 4th income brackets spends € 8,200 on health. What is its annual income?**
- A. € 40,000  
 B. € 42,000  
 C. € 38,000  
 X D. € 41,000
4. **Which of the following statements is NOT true?**
- X A. All of the families in the second income bracket spend less than € 9,000 on housing.  
 B. A family with an income of € 13,000 spends the same amount on food as a family with an income of € 39,000 spends on clothing.  
 C. A family with an income of € 14,000 spends the same amount on food as a family with an income of € 42,000 spends on clothing.  
 D. A family with an income of € 40,000 spends € 16,400 on food.
5. **Which of the numbers below is related to the following?  
 24 42 63 18 69**
- A. 46  
 X B. 78  
 C. 52  
 D. 68
6. **Choose the alternative that is a logical equivalent of the following sentence:  
 Some European state is member of NATO.**
- X A. Most European states are not members of NATO  
 B. At least one European state is a member of NATO  
 C. Most European states are members of NATO  
 D. At least one European state is not a member of NATO

7. **Three friends have 80, 90 and 100 euro each. Their first names are John, Philip and Nick. Their surnames are Smith, Bell and Collins. Given that:**
- Philip has less than Mr. Bell;
  - John has 90 euro;
  - Neither Nick nor Mr. Smith has 80 euro
- which of the following is correct?**
- A. John Bell has 90 euro  
 B. Nick Collins has 100 euro  
 X C. Nick Bell has 100 euro  
 D. John Collins has 90 euro
8. **Five exporters each have, respectively, a turnover of 5, 10, 15, 20 and 25 million euro. Each one only has one office, which are found in the cities of Boston, Madrid, Amsterdam, Genoa and Frankfurt, although not necessarily in that order. Moreover, each of them only handles one specific merchandise. If we know that:**
- The coffee exporter has his office in Madrid
  - The corn exporter has a turnover of 10 million euro
  - The Boston office has a turnover of 5 million euro and deals in barley
  - The exporter with a 20 million euro turnover deals in cocoa and has an office in Genoa.
  - The Frankfurt office has a turnover of 15 million euro
  - One of the exporter deals in soya
- which of the following statements is wrong?**
- A. The exporter with a turnover of 10 million euro isn't in Madrid  
 B. The Madrid office has a turnover of 25 million euro  
 X C. The soya exporter has a turnover of more than 20 million euro  
 D. The Amsterdam office has a turnover of 10 million euro
9. **Which of the diagrams illustrates the relationship between the given terms?**

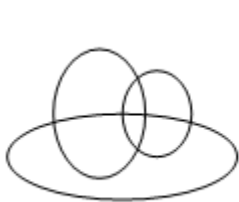


DIAGRAM 1



DIAGRAM 2



DIAGRAM 3



DIAGRAM 4



DIAGRAM 5

Scandinavians, people with fair hair, women

- A. Diagram 3  
 B. Diagram 5  
 X C. Diagram 1  
 D. Diagram 4
10. **The McCann company makes boxes. To assemble 1,000 boxes, machine "x" takes 3 days, whereas machine "y" needs a third of the time it takes machine "x", and machine "z" only needs half the time it takes machine "x". How many days would it take the McCann company to assemble the 1,000 boxes if it has one each of the machines?**
- A. One day  
 X B. Half a day  
 C. A day and a half  
 D. Two days
11. **Which of the following inequalities is verified if and only if  $x > 3$  ?**
- X A.  $6x + 7 > 3x + 16$   
 B.  $6x + 5 > 2x - 7$   
 C.  $6(x + 4) < 2x + 1$   
 D.  $6x - 7 > 3x - 8$
12. **Which are the real values of x for which the function  $f(x) = \sqrt{x-4}$  is defined?**
- A.  $x \leq 4$   
 B.  $x \geq 2$   
 X C.  $x \geq 4$   
 D.  $x \leq -2$

13. **Through two distinct points in the plane:**
- A. more than two distinct lines pass
  - B. infinite distinct lines pass
  - C. only two distinct lines pass
  - X D. only one line passes
14. **Given a triangle with sides AB and BC of the same length and a  $70^\circ$  angle in B, what is the angle in A?**
- A.  $65^\circ$
  - X B.  $55^\circ$
  - C.  $50^\circ$
  - D.  $60^\circ$
15. **Divide the following polynomial into factors  $2x^3 - 3x^2y - 2x^2z - 2xz + 3xyz + 3yz$ .**
- A.  $(2x + 3y)(x^2 - xz - z)$
  - B.  $(2x - 3y)(x^2 - x^2z - z^2)$
  - C.  $(2x + 3y)(x - x^2z + z^2)$
  - X D.  $(2x - 3y)(x^2 - xz - z)$
16. **In the Cartesian plane, which of the following straight lines passes through the point P of coordinates (3, 5)?**
- A.  $y = 2x + 1$
  - X B.  $y = 2x - 1$
  - C.  $y = \frac{2}{3}x - 1$
  - D.  $y = \frac{2}{3}x + 1$
17. **In the Cartesian plane, the lines  $3x + 5y - 17 = 0$  and  $6x + 10y + 5 = 0$  are:**
- X A. parallel
  - B. perpendicular
  - C. coincident
  - D. incident
18. **The polynomial  $4x^4y - 5x^2y^4 + 7x^3y^2$  is:**
- A. second degree with respect to the x, first degree with respect to the y and has a total degree equal to 5
  - B. third degree with respect to the x, fourth degree with respect to the y and has a total degree equal to 8
  - C. fourth degree with respect to the x, second degree with respect to the y and has a total degree equal to 4
  - X D. fourth degree with respect to the x, fourth degree with respect to the y and has a total degree equal to 6
19. **If  $X = \{b, c, e, f, g, t\}$  and  $Y = \{a, b, e, f, i\}$ , then:**
- A.  $X \subset Y$
  - B.  $X \cup Y = \{a, b, i\}$
  - C.  $X \cap Y = \{a, c, g, i\}$
  - X D.  $X \cap Y = \{b, e, f\}$
20. **Given the sets  $A = (-\infty; 4]$ ,  $B = (-2; +\infty)$  and  $C = (-2; 4]$  it is true that:**
- A.  $C = A + B$
  - B.  $C = A \cup B$
  - X C.  $C = A \cap B$
  - D.  $C = A - B$
21. **What is the arithmetic average of the natural numbers 4, 5, 6, 9, 13, 14, 19?**
- A. 9
  - B. 14
  - C. 12
  - X D. 10

22. The equations system :

$$\begin{cases} 3x - 2y = -12 \\ x + 2y = 4 \end{cases}$$

has the solution :

- A.  $x = \frac{1}{4}; y = \frac{4}{5}$   
X B.  $x = -2; y = 3$   
C.  $x = \frac{1}{2}; y = \frac{3}{2}$   
D.  $x = 2; y = -3$

23. The solution of the equation  $6x - 41 = 4x - 19$  is:

- X A. 11  
B. 9  
C. 13  
D. -13

24. When  $A = (7, 3)$  and  $B = (-3, -5)$  are the extremes of a segment, determine the middle point  $M$ .

- A.  $M = (1, -2)$   
X B.  $M = (2, -1)$   
C.  $M = (4, -2)$   
D.  $M = (10, 8)$

25. Which of the following sequences of numbers is arranged in a strictly increasing order?

- A.  $-\sqrt{2}; -\frac{1}{3}; \frac{2}{5}; \frac{1}{3}$   
X B.  $-\sqrt{5}; -\frac{1}{2}; \frac{1}{3}; \frac{5}{4}$   
C.  $-\sqrt{3}; -\frac{2}{3}; \frac{4}{3}; \frac{7}{6}$   
D.  $2; -\frac{2}{5}; \frac{3}{7}; \frac{4}{3}$

26. The set of all the solutions of the inequality  $x^2 - 5x + 6 > 0$  is:

- A.  $x < -3; x > 2$   
X B.  $x < 2; x > 3$   
C.  $2 < x < 3$   
D.  $x < -2; x > 3$

27. What is the solution to the inequality  $\frac{5x+1}{-4} > 6$  ?

- X A.  $x < -5$   
B.  $x > -5$   
C.  $x > 6$   
D.  $x < 6$

28. Given the numbers 429, 517, 726, 858, 979 we can say that:

- X A. they are all divisible by 11  
B. they are all divisible by 3 and by 4  
C. they are all divisible by 3  
D. they are all divisible by 3 and by 11

29. A player rolls a dice and wins if he gets an odd number that is less than 5. What is the probability of winning?

- A.  $\frac{1}{6}$   
B.  $\frac{1}{2}$   
X C.  $\frac{1}{3}$   
D.  $\frac{2}{3}$

30. If the population of a town composed of 15.000 inhabitants increases by 10% a year, three years later the population will amount to:

- A. 19.555 inhabitants  
B. 19.795 inhabitants  
X C. 19.965 inhabitants  
D. 18.765 inhabitants

31. In the Cartesian plane, the intersecting point of the lines  $2x - 3y - 4 = 0$  and  $3x + 2y - 6 = 0$  has coordinates:
- A. (0, 1)  
 B. (0, -2)  
 C. (-2, 0)  
 X D. (2, 0)
32. The point common to the two lines  $2x - y + 1 = 0$  and  $x + y - 7 = 0$  is:
- A. (-2, -5)  
 B.  $(\frac{1}{2}, 5)$   
 X C. (2, 5)  
 D. (2, -5)
33. The parabola  $y = ax^2 + bx + c$  is a symmetrical curve with respect to equation line r:
- A.  $y = -\frac{b}{a}x$   
 B.  $x^2 - y^2 = a^2$   
 C.  $x^2 + y^2 = a^2$   
 X D.  $x = -\frac{b}{2a}$
34. In the Cartesian plane, for what value of q does the equation line  $y = 2x + q$  pass through the point of coordinates (5, 2)?
- A.  $q = -4$   
 B.  $q = \frac{1}{4}$   
 X C.  $q = -8$   
 D.  $q = 8$
35. Which of the following expressions is equal to the polynomial  $(a^3 + b^3)$  ?
- A.  $(a - b)(a^2 + ab + b^2)$   
 B.  $(a + b)(a^2 + 2ab + b^2)$   
 C.  $(a + b)(a^2 + ab + b^2)$   
 X D.  $(a + b)(a^2 - ab + b^2)$
36. Determine the set among the following that does NOT contain fractions that are all equivalent to each other.
- A.  $\{ \frac{9}{27}; \frac{27}{81}; \frac{3}{9}; \frac{108}{324} \}$   
 B.  $\{ \frac{13}{52}; \frac{39}{156}; \frac{117}{468}; \frac{65}{260} \}$   
 C.  $\{ \frac{2}{16}; \frac{4}{32}; \frac{12}{96}; \frac{48}{384} \}$   
 X D.  $\{ \frac{4}{20}; \frac{8}{40}; \frac{12}{72}; \frac{16}{80} \}$
37. In the Cartesian plane, what is the equation of the line passing through point A = (2, 3) and parallel to line  $2x - 4y + 3 = 0$  ?
- A.  $2x - 3y + 5 = 0$   
 X B.  $x - 2y + 4 = 0$   
 C.  $x + 2y + 6 = 0$   
 D.  $x + 2y - 4 = 0$
38. What is the result of the expression  $(x^4y^5)^3(x^2y^4)$  ?
- X A.  $x^{14}y^{19}$   
 B.  $x^9y^{12}$   
 C.  $x^{24}y^{60}$   
 D.  $x^{10}y^{11}$
39. Which of the following triads cannot represent the measurements of the sides of a triangle?
- X A. 3, 7, 11  
 B. 6, 8, 10  
 C. 3, 4, 6  
 D. 5, 12, 15
40. The set of all the solutions of the equation  $x^2 + 8x + 15 = 0$  is:
- A.  $\{5; 3\}$   
 X B.  $\{-5; -3\}$   
 C.  $\{-5; 3\}$   
 D.  $\{5; -3\}$

41. Determine the distance between points  $A = (2, 3)$  and  $B = (-4, -5)$ .
- X A. 10  
B. 8  
C. 37  
D.  $\sqrt{12}$
42. How many real solutions exist to the equation  $(x^2 - 4)(x^2 + 9)(x - 1) = 0$  ?
- A. 4  
B. 2  
C. 1  
X D. 3
43. The distance between the centres of two secant circumferences is:
- A. equal to the difference of the radii  
B. equal to the sum of the radii  
X C. less than the sum of their radii and greater than their difference  
D. greater than the sum of the radii
44. When a set consists of 5 elements, how many subsets of 3 elements does it contain?
- A. 6  
X B. 10  
C. 8  
D. 5
45. Indicate, among the following, the pair of numbers that verifies the identity  $2x - 3y = 5$ .
- A.  $(-2, 1)$   
B.  $(2, 1)$   
C.  $(-1, 1)$   
X D.  $(1, -1)$









