### **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 P00000

- 1. Mario left his house and walked towards Enrico's house, 48 km away. Two hours later, Enrico left his house and ran towards Mario's house. If Mario's speed was 4 km per hour and Enrico's 6 km per hour, how many km had Mario walked when he met Enrico?
- **A.** 8
- **B.** 11
- **C.** 22
- •**D.** 24
- 2. Six people travel for work during the first six months of the year. Knowing that:
  - each person leaves on a different month;
  - Silvano leaves in January;
  - Paolo leaves after Luigi and Carlo;
  - Luigi and Carlo leave on two consecutive months (not necessarily in that order);
  - Mario and Dario will not leave on two consecutive months; which is the latest month for Carlo to leave?
- A. May
- •B. April
- C. June
- D. February
- 3. A 20m high pole projects a 5m shadow. If, at the same time of the day, a building projects a 20m shadow, how high is the building?
- **A.** 4m
- **B.** 400m
- **C.** 100m
- •**D.** 80m
- 4. The sum of 200 consecutive natural numbers, the first of which is 200, equals to:
- **A.** 19900
- •**B.** 59900
- **C.** 39900
- **D.** 80200
- The statement form ¬(p∨(¬p∧q)) is equivalent to:
- A.  $\neg (p \land q)$
- B. ¬(p∨q)
- c.  $(\neg p \lor q)$
- **D.**  $p \lor q$
- 6. Three clocks chime as follows: the first every 3 hours, the second every 4 hours and the third every 5 hours. Today, Tuesday, they will chime contemporarily at 16:00 Hrs. When and at what time will they chime again at the same time?
- A. Thursday, at 04:00
- **B.** Friday, at 12:00
- C. Wednesday, at 16:00
- •**D.** Friday, at 04:00
- 7. Say which of the numbers below is the next in the sequence 10, 11, 13, 16 ...
- **A.** 17
- **B.** 18
- **C.** 19
- •**D.** 20
- 8. At the nearest "Do-it-yourself" shop you buy 1432 m of a metallic net to outline the straight boundary of a field. Every 4 m you need to place also support poles. How many poles do you need to purchase?
- **A.** 360
- **B.** 358
- **C.** 356
- •**D.** 359

- 9. Two oil cans have a total capacity of 19 litres. The biggest contains three times more oil than the smaller plus one litre. How many litres does each can contain?
- **A.** 14 and 6
- **B.** 12 and 7
- **C.** 14 and 5
- •D. 14.5 and 4.5
- 10. In Italy, the average grade in the first level degree in Engineering is 98.1/110, while the average grade of exams is 24.6/30. Knowing that the difference between the degree grade and the average grade, is equal to the value (in scale 1/110) of the thesis, which is the average value of the thesis?
- **A.** 79
- **B.** 26.75
- **C.** 2.15
- •**D.** 7.9
- 11. In a class, 10 students play football, 10 play basketball and 10 swim. Of those, only one plays all three sports while the others play only one. By how many students is the class composed?
- **A.** 30
- **B.** 29
- •C. 28
- **D.** 27
- 12. A car importer is planning on increasing the price of a specific model by 1,000€. At this new price 5 fewer cars per month will be sold, but the total revenues will rise by 26,000€, amounting to a total of 594,000€. What is the number of cars the manufacturer would sell at this new price?
- **A.** 51
- **B.** 61
- •C. 66
- **D.** 71
- 13. If a + b = 55 and a \* b = 666, then:
- •**A.** a b = 19
- **B.** a + b = 54
- **C.** a = 12
- **D.** a/b = 2
- 14. Of the answers given to a questionnaire, 8 are wrong and 80% are exact. How many questions does the questionnaire contain?
- **A.** 160
- **B.** 72
- **C.** 48
- •**D.** 40
- **15.** The SPAR supermarket offers to all customers a 10% discount on listed prices, plus a further 5% discount if the sum exceeds 100 euros. Hence, for a 200 euros total, a customer pays:
- •A. 171 euro
- B. 180 euro
- **C.** 170 euro
- **D.** 169 euro
- 16. A capital sum of 400,000 Euro, deposited in a bank, is subject to a 4% annual interest rate. What is its future value in one year time?
- **A.** 404,000 Euro
- **B.** 440,000 Euro
- •C. 416,000 Euro
- **D.** 1,600,000 Euro
- 17. The sum of two consecutive integer numbers is 127. They may be:
- **A.** 62, 65
- **B.** 64, 65
- **C.** 100, 27
- •**D.** 63, 64

- **18.** An admission exam consists of two tests: 2/3 of the candidates pass the first test and only 1/6 of these pass also the second. Of 180 candidates, how many are admitted?
- **A.** 40
- **B.** 30
- **C.** 120
- •**D.** 20
- 19. "All bicycles have two wheels. Marc's vehicle has two wheels". What CANNOT be derived from the previous statements?
- •A. Marc has a bicycle
- B. Marc does not have a car
- C. If Marc has a bicycle, then it has two wheels
- D. Marc's vehicle might be a bicycle
- 20. You may choose between Option 1: receive 100 euro today and invest them at 11% annual interest rate for one year; Option 2: receive 110 in one year. What is preferable?
- A. Options 1 and 2 are indifferent
- •B. Option 1 is preferable
- C. Option 2 is preferable
- D. The question cannot be answered
- 21. In a class of 40 students, 12 enrolled for both Italian and Greek. 22 enrolled for Greek. If the students of the class enrolled for at least one subject (Italian or Greek), how many students enrolled for only Italian and not Greek?
- **A.** 16
- **B.** 30
- **c.** 20
- •**D.** 18
- 22. If A is the set of the prime numbers between 1 and 10 and B is the set of the odd numbers between 1 and 10, which of the following statements is true?
- **A.**  $A \subseteq B$
- •**B.**  $A \cap B = \{1,3,5,7\}$
- **C.** A = B
- **D.**  $A \cup B = \{1,3,5,7\}$
- 23. Given,  $A = \{x \in \mathbb{R} | -1 \le x \le 7\}$  and  $B = \{x \in \mathbb{R} | 3 < x < 11\}$ , indicate which of the following sentences is true:
- •A.  $A \cap B = \{x \in \mathbb{R} | 3 < x \le 7\}$
- **B.**  $A \cup B = \{x \in \mathbb{R} | -1 < x < 11\}$
- **c.**  $A \cup B = \{x \in \mathbb{R} | 3 < x \le 11\}$
- **D.** all other sentences are false
- 24. Given the sets A, B, C we know that A and C have no elements in common and that A is contained in B. Which of the following deductions is true in general?
- A. B and C have no elements in common
- **B.** The elements of B not in A are contained in C
- C. B and C have nonempty intersection
- •D. B and C may have empty intersection or not
- 25. If *a* is a positive integer and the square of *a* is divisible by 72, then it is certainly true that *a* is divisible by:
- **A.** 72
- •**B.** 12
- **C.** 24
- **D.** 36
- 26. Assuming that x equals the product of integers from 1 to 9, exclusive. The number of different prime factors of x larger than 1 is:
- **A.** 3
- •**B.** 4
- **C.** 5
- **D.** 7

- 27. Select the answer in which the following numbers appear in ascending order:  $\sqrt{17},\ 4\sqrt{2},\ \sqrt{46},\ 3\sqrt{3},\ 2\sqrt{5}$
- A. √17, 3√3, 2√5, 4√2, √46
- ▶ √17, 2√5, 3√3, 4√2, √46
- C. 2√5, √17, 3√3, 4√2, √46
- **D.**  $2\sqrt{5}, 3\sqrt{3}, 4\sqrt{2}, \sqrt{17}, \sqrt{46}$
- 28. Calculate the least common multiple of the following numbers 15, 27 e 45.
- **A.** 75
- •**B.** 135
- **C.** 45
- **D.** 3
- 29. What is the result of (15/4) : (3/64)?
- **A.** 45/256
- **B.** 5/64
- •**C.** 80
- **D.** 5/12
- 30. The number 1250 is divisible:
- •A. by 2 and by 5
- B. by 11 and by 18
- **C.** by 5 and by 13
- **D.** by 3 and by 4

#### 31. Which is the value of x satisfying 7: 3 = x: (x + 2)?

- ●**A.** -7/2
- **B.** 3/7
- **C.** −6/7
- **D.** -14/3

#### **32.** Determine the degree of the polynomial $2a^2 + a^3x^4 + x^5 + 9$ .

- •**A.** 7
- **B.** 6
- **C.** 4
- **D.** 5

#### 33. Simplify the expression [-48x + 30x - 2(2x - 7x - 3x)]:2.

- •**A.** -*x*
- **B.** 21*x*
- **C.** −21*x*
- **D.** *x*

#### 34. If $6^n$ is an integer factor of $(10!)^2$ , the largest possible value of *n* is:

- **A.** 2
- **B.** 6
- •**C.** 8
- **D.** 24

#### 35. If ab+c = a(b+c), which of the following must be true?

- •A. *a*=1 or *c*=0
- **B.** *a*=0 and *b*=0
- **C.** *a*=1 and *b*=1
- **D.** *b*=1 and *c*=0

#### 36. The solution of the equation 3x-6(1-2x)=45-3x is:

- •**A.** 17/6
- **B.** 15/3
- **C.** 19/3
- **D.** 5/6

37. The equation (x-3)/(x-2) = 7 has solutions:

- **A.** 3
- **B.** 2 and 3
- •**C.** 11/6
- **D.** it has no solutions
- **38.** The solutions of the equation  $x^4+4x^2-21=0$  are:
- A. \_√3, √3
- **B.** 3, 3
- **C.** ± 3, ± 3
- **D.** 2, 1

#### **39.** The solution of the inequality $16x - x^3 > 0$ is:

A. x < -4 or 0 < x < 4</li>
B. x < -2 or 0 < x < 2</li>
C. 0 < x < 2</li>
D. x < -8</li>

#### 40. The solution of the inequality $3x^2 - 4x - 7 < 0$ is:

- •**A.** 1 < x < 7/3
- **B.** 1/4 < *x* < 9/4
- **C.** +1 < *x* < + 7/3
- **D.** x < -2 V x > 1/4
- 41. Compute the solution of the inequality (2x 8)/(1 x) > 0.
- •**A.** 1 < *x* < 4
- **B.** 0 < *x* < 4
- **C.** 2 < *x* < 4
- **D.** 1 < *x* < 2

**42.** Which of the following is the graph of the line of equation  $2x - 3y = \frac{2}{3}$ ?



**43.** The graphic representation of the function  $y = (-2x + 10)^2$  is:



44. Which of the following equations represents an ellipse?

- **A.**  $y = (x 1)^2$
- **B.**  $y = 3x^2$
- •**C.**  $x^2 + 4y^2 = 1$
- **D.**  $x^2 y^2 = 1$

#### 45. y-coordinates of Parabola $y^2 = x + 2$ and circle $x^2 + y^2 = 4$ points of intersection are given by:

- **A.** 2, 2
- **B.** 0
- •C. 0,  $\sqrt{3}$ ,  $-\sqrt{3}$
- **D.** 1, 2, -1

