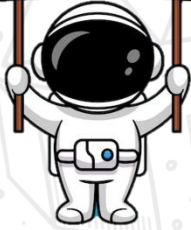




A TRADITION OF EXCELLENCE



INSTRUCTIONS

You are about to take Copernicus Exam.

Please read the followings carefully.

1. The exam has 25 multiple choice-questions. Each question weighs 4 points. The maximum score a student can get is 100. There is a penalty of one point for each incorrect answer. So only answer the questions you are sure of.
2. Start with the easier questions, you can always come back to the questions you leave.
3. The time allocated for the exam is 60 minutes. You will start when the invigilator tells you to start.
4. You are required to comply with the directions given by the head invigilator before the examination.
5. Those who are taking the exam with a mobile phone **MUST** make sure that during the examination no one calls.
6. If anything in the examination is unclear, you can contact the invigilator.
7. Where permitted you may use a translation dictionary.
8. Students must not give or receive assistance of any kind during the exam. Any cheating, any attempt to cheat, assisting others to cheat, participating therein, or engaging in such improper conduct is a serious violation and will generally result in disqualifying.

Remember that "Hard work beats talent when talent doesn't work hard"
We wish you the very best luck on the exam.



1. How many times do you have to write the digit 9, when you write the numbers from 1 to 100?

- A) 10
- B) 11
- C) 19
- D) 20

2. From number 209827325 delete 4 digits so that you get the smallest number. What will be the product of deleted digits?

- A) $9 \cdot 8 \cdot 7 \cdot 3$
- B) $9 \cdot 8 \cdot 7 \cdot 5$
- C) $9 \cdot 8 \cdot 7 \cdot 2$
- D) $9 \cdot 8 \cdot 3 \cdot 5$

3. There are 12 bicycles in the garden, with 2 or 3 wheels. Total number of wheels are 30. How many bicycles are there with 2 wheels?

- A) 3
- B) 4
- C) 6
- D) 8

4. $X\Delta Y = X + 2 \cdot Y$ and $X\Omega Y = X \cdot Y$. What will be $(107\Delta 115)\Omega 6$?

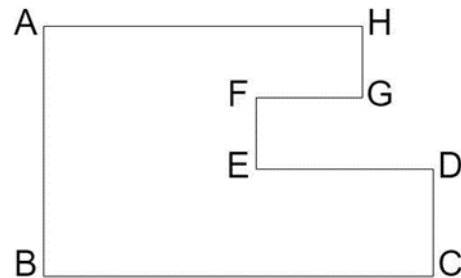
- A) 228
- B) 2022
- C) 1332
- D) 80730

5. Calculate:

$$9 + 99 + 999 + 9\,999 + 99\,999 + 999\,999$$

- A) 9 999 999
- B) 1 888 888
- C) 987 654 321
- D) 1 111 104

6. Find the perimeter of $ABCDEFGH$ if $AB = 6$, $BC = 9$, and $FG = 2$.



- A) 20
- B) 24
- C) 26
- D) 34

7. X is remainder when 2022 is divided by 11 and Y is remainder when 2022 is divided by 9. What will be $X + Y$?

- A) 20
- B) 2022
- C) 4
- D) 15

8. One chicken eats 200 g food per day. How many chickens will eat 8 kg of food in 4 days?

- A) 10
- B) 8
- C) 12
- D) 6

9. How many three-digit numbers can be written only with even number?

- A) 900
- B) 450
- C) 500
- D) 100

10. How many squares exist on the picture?



- A) 15
- B) 20
- C) 18
- D) 24

11. The length, width and height of the aquarium is 10 cm, 20 cm and 30 cm. What will be water volume if a quarter of the aquarium is filled?

- A) 1000
- B) 1500
- C) 2000
- D) 3000

12. How many natural divisors does a product of three prime numbers have?

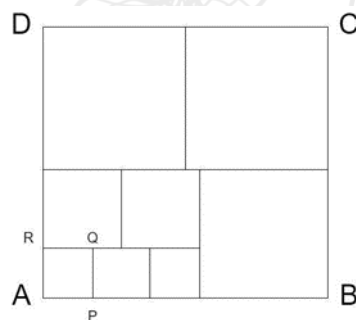
- A) 3
- B) 6
- C) 8
- D) 9

13. Calculate:

$$\left(1 - \frac{1}{2}\right) \cdot \left(1 - \frac{1}{3}\right) \cdot \left(1 - \frac{1}{4}\right) \cdot \dots \cdot \left(1 - \frac{1}{21}\right) \cdot \left(1 - \frac{1}{22}\right)$$

- A) $\frac{1}{2}$
- B) $\frac{1}{10}$
- C) $\frac{1}{22}$
- D) $\frac{1}{2 \cdot 3 \cdot 4 \cdot \dots \cdot 22}$

14. The perimeter of $ABCD$ rectangle is 43. Calculate the perimeter of $APQR$, if all little rectangles are squares.



- A) 3
- B) 4
- C) 5
- D) 6

15. Speed of the dog is 4600 dm/min , speed of the cat is 8 m/s and speed of the mouse is 27 km/h . Which one is faster?

- A) Dog
- B) Cat
- C) Mouse
- D) Dog and Cat

16. Alex has 3 pairs of shoes, 4 pants and 5 t-shirts. How many different ways of putting clothes are there?

- A) 12
- B) 24
- C) 30
- D) 60

17. Jim thought of a number. Jack multiplied Jim's imaginary number by 4 and then added 15. Jane multiplied Jim's imaginary number by 15 and added 4. What number did Jimmy come up with if Jack and Jane got the same answer?

- A) 1
- B) 2
- C) 3
- D) 4

18. The store has 4 plates, 3 cups and 7 spoons (all items are different colors). How many ways can you buy two different items?

- A) 14
- B) 28
- C) 61
- D) 84

19. Calculate the sum:

$$1 + 3 + 5 + \dots + 97 + 99$$

- A) 2500
- B) 5050
- C) 5000
- D) 4950

20. The letters in the word MATHEMATICIAN were put in a box. What is the chance of getting letter A?

- A) 3 out of 9
- B) 3 out of 10
- C) 3 out of 13
- D) 3 out of 11

21. Alex received a container of fresh eggs. He sold $\frac{1}{3}$ of the eggs in the morning and sold 320 eggs in the afternoon. At the end of the day, he found that $\frac{1}{4}$ of the eggs were not sold. How many eggs did he receive in the beginning?

- A) 768
- B) 448
- C) 1224
- D) 549

22. How many numbers are there in the sequence $11, 14, 17, 20, \dots, 71, 74$?

- A) 20
- B) 21
- C) 22
- D) 23

23. To complete the grid below, each of the digits from 1 to 4 must occur exactly once in each row and in each column. What number should replace X?

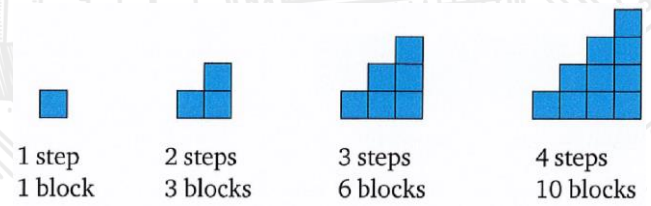
1		2	
2	3		
			4
			X

- A) 1
- B) 2
- C) 3
- D) 4

24. Let the operation $*$ be defined by $a * b = ab - a - b + 2$. If $7 * b = 13$, what is the value of b ?

- A) 1
- B) 2
- C) 3
- D) 4

25. These steps are made of blocks. How many blocks are needed to make 100th step?



- A) 100
- B) 250
- C) 1010
- D) 5050