

**Chestionar de concurs – varianta A**

**MATEMATICA**

1. Soluția reală a ecuației  $2^{2x-1} = 8^x$ , este:

A	B	C	D
2	0	-1	1

2. Fie  $f: [0,1] \rightarrow \mathbb{R}$ ,  $f(x) = ax + 2$ ,  $a \in \mathbb{R}^*$ . Dacă volumul corpului obținut prin rotația graficului funcției  $f$  în jurul axei  $Ox$  este  $4\pi$ , atunci valoarea lui  $a$  este:

A	B	C	D
$\frac{1}{6}$	6	-6	$-\frac{1}{6}$

3. Dacă definim pe  $\mathbb{R}$  legea "\*" prin  $x * y = xy - 3(x + y) + 12$ , atunci valorile reale ale lui  $x$ , pentru care  $x * x = 12$ , sunt:

A	B	C	D
$\{-12,0\}$	$\{0,12\}$	$\{-6,0\}$	$\{0,6\}$

4. Fie  $x_1, x_2 \in \mathbb{R}$  soluțiile ecuației  $\begin{vmatrix} 3 & 3 \\ 2 & 4 \end{vmatrix} = x^2 + x$ . Atunci  $x_1 \cdot x_2$  este egal cu:

A	B	C	D
6	-6	0	1

5. Mulțimea primitivelor funcției  $f: \mathbb{R} \rightarrow \mathbb{R}$ ,  $f(x) = 4x^3 - 3x^2 + 2x - 1$  este:

A	B	C	D
$x^4 - 3x^3 + x^2 - 2x + C$	$x^4 - x^3 + x^2 - x + C$	$4x^4 - x^3 + 2x^2 - x + C$	$x^4 - 3x^3 + x^2 + 2x + C$

6. Dacă  $a \in \left(\frac{\pi}{2}, \pi\right)$  și  $\sin a = \frac{5}{13}$ , atunci  $\operatorname{tg} a$  este:

A	B	C	D
$-\frac{1}{12}$	$-\frac{11}{12}$	$-\frac{7}{12}$	$-\frac{5}{12}$

7. Dacă  $2\bar{z} + z = 3 + 4i$ , atunci  $|z|$  este:

A	B	C	D
$\sqrt{17}$	$\sqrt{18}$	$\sqrt{13}$	$\sqrt{15}$

8. Fie funcția  $f: \mathbb{R} \rightarrow \mathbb{R}$ ,  $f(x) = 3x^2 - x + 5$  și  $B = f''(-1) + f'(-1) + f(-1)$ . Atunci  $B$  are valoarea:

A	B	C	D
0	-1	3	8

9. Valoarea numărului real  $x$  pentru care numerele  $2, x, 4 + x$  sunt în progresie aritmetică este

A	B	C	D
1	0	6	3

## INFORMATICĂ

10. Ce afișează următoarea secvență de program C/Pascal?

<code>char s[25]="Admitere 2024 in ANMB.";</code>		<code>String s:='Admitere 2024 in ANMB.';</code>	
<code>cout&lt;&lt;strlen(s); // printf("%d",strlen(s));</code>		<code>write(length(s));</code>	
A	B	C	D
19	14	18	22

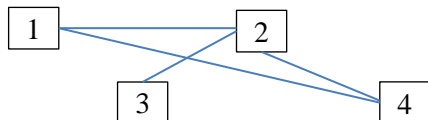
11. Se consideră următorul subprogram recursiv. Indicați valoarea expresiei  $r(22,1)$  ?

<code>int r(int x,int y)</code> { if (x<=0) return 0; else return r(x/10, y*10)+x*y; }		<code>function r(x,y:integer):integer;</code> begin if x<=0 then r:=0; else r:=r(x div 10, y*10)+x*y; end;	
A	B	C	D
22	24	42	442

12. Ce valori se vor afișa in urma executării subprogramului ca urmare a apelului subprogram(3,5)?

<code>void subprogram(int x,int y)</code> { if(x<y) { x++; subprogram(x, y); cout<<x+y; // printf("%d",x+y); } cout<<x<<y; // printf("%d%d",x,y); }		<code>procedure subprogram(x, y:integer)</code> begin if x<y then begin x:=x+1; subprogram(x, y); write(x+y); end; write(x, y); end;	
A	B	C	D
549550155	945551055	551055945	551055954

13. Care matrice de adiacență corespunde grafului următor?



A	B	C	D
$\begin{pmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{pmatrix}$	$\begin{pmatrix} 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{pmatrix}$

14. Fie matricile  $A \in \mathcal{M}_{3,4}(\mathbb{R})$ ,  $B \in \mathcal{M}_{4,6}(\mathbb{R})$  și  $C \in \mathcal{M}_{6,2}(\mathbb{R})$ . Numărul minim de operații de înmulțire pentru calculul produsului  $A \cdot B \cdot C$  este egal cu:

A	B	C	D
72	108	200	36

15. Care este a 5-a pereche afișată de algoritmul următor, dacă vectorii U și V au valorile  $U=(\text{"A"},\text{"D"},\text{"M"})$  și  $V=(2,0,2,4)$ .

Pentru X = 1 la Length(U) Pentru Y = 1 la Length(V) Afiseaza U[X] V[Y]			
A	B	C	D
D 0	D 2	A 2	M 4

16. Fie mulțimea  $A = \{2, 4, 6, 8, 10\}$ . Folosind metoda backtracking se generează elementele produsului cartezian  $A \times A \times A$ . Numărul de soluții generate este egal cu:

A	B	C	D
100	25	125	1024

17. Pentru definierea unui punct Q de coordonate (x,y) în plan se definește structura C / înregistrarea Pascal:

<pre>struct p {     float x,y; }; p Q;</pre>	<pre>type p=record     x,y : real; end; var p Q;</pre>
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Pentru a testa dacă punctul Q este în cadranul I al sistemului cartezian de coordonate se poate folosi expresia:

A	B	C	D
C: $Q.x \geq 0 \parallel Q.y \geq 0$ Pascal: $Q.x \geq 0$ or $Q.y \geq 0$	C: $Q.x \geq 0$ Pascal: $Q.x \geq 0$	C: $Q.x \geq 0 \ \&\& \ Q.y \leq 0$ Pascal: $Q.x \geq 0$ and $Q.y \leq 0$	C: $Q.x \geq 0 \ \&\& \ Q.y \geq 0$ Pascal: $Q.x \geq 0$ and $Q.y \geq 0$

18. Ce mesaj afișează următoarea secvența de program C/Pascal dacă X are valoarea 20 și Y are valoarea 24?

<pre>if (X&lt;=Y) cout&lt;&lt;"Adm"; // printf("Adm"); if (X&gt;=Y) cout&lt;&lt;"ANMB"; // printf("ANMB"); else cout&lt;&lt;"2024"; // printf("2024");</pre>	<pre>if (X&lt;=Y) then write('Adm'); if (X&gt;=Y) then write('ANMB'); else write('2024');</pre>		
A	B	C	D
Adm2024	2024	Adm	AdmANMB

**LIMBA ENGLEZĂ**  
**Reading Comprehension**

Denmark, which is the smallest and most southerly of the countries of Scandinavia, lies in northern Europe. It is probably best known for being the home to the powerful Vikings, over 1,000 years ago. Denmark is a small country, with limited natural resources. However, it has become one of the richest countries in the world. Wealth in Denmark is shared out more evenly than in most countries, because people pay high taxes. Many workers pay more than 50% of their wages in tax. The money is used to pay for a welfare system, which includes health care, benefits for the unemployed and the elderly, and public services. Compared to the rest of the world, it is difficult to be either very rich or very poor in Denmark.

19. Denmark ...

A	B	C	D
is rich in natural resources.	is now populated by Vikings.	is located in the south of Europe.	occupies a limited territory.

20. In Denmark, ...

A	B	C	D
only the richest people have to pay high taxes.	the high taxation supports the social welfare system.	we find the richest people in the world.	people spend 50% of their income on health care.

Most people were not impressed when, in 1913, the Daily Mail newspaper offered 10,000 pounds to the first pilot to fly across the Atlantic in under 72 hours. The majority of scientists even said it could not be done. Certainly, the problems involved were many and very different. Obviously, the design of the airplane was of great importance, but so were the skill and courage of the pilot and the navigator. Weather conditions also had to be taken into consideration. A very few enthusiasts thought it might be possible ten years later. They were wrong. A pilot received the prize just six years later.

21. When the Daily Mail offered a prize in 1913 for flying across the Atlantic, ...

A	B	C	D
many enthusiastic amateurs were eager to try.	the majority of scientists thought it could be done.	there were few airplanes that could stay in the air for more than 72 hours.	few people thought it was possible to do this within the next ten years.

22. The 10,000 pounds prize offered by the Daily Mail in 1913 ...

A	B	C	D
was won ten years later	was awarded even earlier than some enthusiasts expected	was never won	aimed at encouraging better aircraft design

Weapons at parties and on the street may be commonplace, but what about at school? Arlington's Wakefield High School, the pupils say, is less violent now than it was a few years ago. A strong security program is partly responsible for the improvement. The kids know that, but they also dislike some of the security measures. Still, they say they feel safe at Wakefield, and they're glad that the school has not installed metal detectors, although they know that some banned items are still brought to school.

23. How do the kids feel about the security measures that have been used in their school?

A	B	C	D
They would like more guards.	They want more items banned.	They don't like some of them.	They would like more metal detectors.

24. What kind of school is Arlington's Wakefield High School, according to the text?

A	B	C	D
a banned school	a private school	an international school	a less violent school

**Vocabulary & Grammar**

25. All guests are \_\_\_\_\_ to check out of their rooms by 11.00 am.

A	B	C	D
explained	forbidden	required	charged

26. \_\_\_\_\_ of workers went on strike for their rights.

A	B	C	D
thousand	thousand`s	thousands	thousands`

27. Which has \_\_\_\_\_ legs, a spider or a fly?

A	B	C	D
mostly	much	manier	more

28. This fish is not what I \_\_\_\_\_.

A	B	C	D
commanded	called	tasted	ordered

29. He had to call \_\_\_\_\_ police immediately.

A	B	C	D
the	an	a	-

30. The building workers were paid their \_\_\_\_\_ in full.

A	B	C	D
salaries	figures	fees	incomes

31. This \_\_\_\_\_ is a specialty of our restaurant.

A	B	C	D
plate	dish	serving	waiter

32. I'm going to spend a few days with some \_\_\_\_\_ of mine, who live in Austria.

A	B	C	D
ancestors	relatives	companies	families

33. I should be getting back; I didn't realize it was \_\_\_\_\_.

A	B	C	D
lately	too later	so late	late enough

34. He was born on the \_\_\_\_\_ of January.

A	B	C	D
31st	13	31th	31

35. She celebrated her \_\_\_\_\_ birthday at a restaurant.

A	B	C	D
an	a	the	-

36. She works as a \_\_\_\_\_ in a bank.

A	B	C	D
pilot	nurse	clerk	teacher

Se acordă 1 punct din oficiu.

Președintele Comisiei de Admitere

Cdor conf. univ. dr. Filip Nistor