MATEMATIKA (INFORMATIKA BILAN)

I variant

1. Agar $\overline{abc}$, $\overline{bca}$, $\overline{cab}$ uch xonali natural sonlar yig'indisi 777 ga teng bo'lsa, $a + b + c$ ni toping.

A) 7   B) 6   C) 8   D) 2

2. $4,8 = x + \dfrac{y}{5}$ tenglikda x va y sonlar 5 dan kichik natural sonlar bo'lsa, y ning qiymatini toping.

A) 1   B) 3   C) 4   D) 0

3. $2 < a < 6$ va $2 < b < 10$ bo'lsa, a va b butun sonlar uchun $\dfrac{1 + \dfrac{a}{b}}{1 + \dfrac{b}{a}}$ kasrning eng katta qiymatini toping.

A) $\dfrac{7}{3}$ B) $\dfrac{5}{3}$ C) 7   D) 15

4. Hisoblang: $\left(1\dfrac{1}{7}\right) \cdot \left(1\dfrac{1}{8}\right) \cdot \left(1\dfrac{1}{9}\right) \cdot \ldots \cdot \left(1\dfrac{1}{62}\right)$

A) 9   B) $\dfrac{11}{7}$ C) 7   D) $\dfrac{10}{7}$

5. Besh xonali $\overline{x734y}$ sonini 55 ga bo'lganda natural son hosil bo'ladi. x ning barcha qiymatlari yig'indisini toping.

A) 11   B) 9   C) 3   D) 14

6. Hisoblang: $\dfrac{1}{2} + \dfrac{2}{3} + \dfrac{3}{2} + \dfrac{4}{3} + \cdots + \dfrac{15}{2} + \dfrac{16}{3}$.

A) 72   B) 24   C) 65   D) 56

7. $\left(x^2 + x\right) + \left(x^2 + 2x\right) + \ldots + \left(x^2 + 19x\right) = 1425$ tenglamani qanoatlantiruvchi x natural sonni toping.

A) 6   B) 10   C) 5   D) 8

8. Soddalashtiring:
$tg\alpha \cdot tg\beta + (tg\alpha + tg\beta) \cdot ctg(\alpha + \beta)$.

A) -1 B) 1   C) 2   D) 0

9. Hisoblang: $\sin 1° + \sin 2° + \sin 3° + \ldots + \sin 359°$.

A) 1   B) -1 C) $\sin 179°$ D) 0

10. Agar $x < -2$ bo'lsa,
$\sqrt{x^2 + 6x + 1} + \sqrt{9 - 12x + 4x^2}$ ifodani soddalashtiring.

A) $2 - x$ B) $x + 2$ C) $-x - 2$ D) $-2x$

11. Agar $2^a = 81$, $3^b = 8$ bo'lsa, $a \cdot b$ qiymatini toping.

A) 14   B) 12   C) 15   D) 18

12. Ifodani soddalashtiring: $\dfrac{a^4 - 10a^2 + 169}{a^2 + 6a + 13}$.

A) $a^2 - 5a + 13$ B) $a^2 + 13$ C) $a^2 - 6a + 13$ D) $a^2 - 3a + 13$

13. a ning qanday qiymatida $\dfrac{9x^2 - 6x + 1}{9} = (x + a)^2$ tenglik ayniyat bo'ladi?

A) $-\dfrac{1}{3}$ B) -1 C) $-\dfrac{1}{4}$ D) $-\dfrac{1}{2}$

14. $\left(a^2 - 2a + 1\right) x = a^2 + 2a - 3$ tenglama a ning qanday qiymatida cheksiz ko'p yechimga ega?

A) $a = -3$ B) $a = 1, a = -3$ C) $a = 1$ D) $a \neq 1$

15. k ning qanday eng kichik natural qiymatida $x^2 + (k + 2)^2 \cdot x + 2k - 4 = 0$ tenglamaning ildizlari 2 dan kichik bo'ladi?

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

16. $(3 - x) \cdot (x + 2) > 0$ tengsizlikning butun yechimlari yig'indisini toping.

A) -3 B) 2   C) 0   D) -5

17. Agar $f(x) = \begin{cases} -x + 2, x < 2 \\ \frac{x-1}{2}, x \geq 2 \end{cases}$ bo'lsa, $f(f(-1))$ ni toping.

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

18. Agar $f(x) = (a + b - 4) \cdot x^3 + 2x^2 + (b - 1) \cdot x$ juft funksiya berilgan bo'lsa, $f(a)$ning qiymatini toping.

A) 12   B) 14   C) 20   D) 18

19. Hisoblang: $\int\limits_1^2 \left(e^x + \dfrac{1}{x}\right) dx$.

A) $e^2 + e - \ln 2$ B) $e^2 - e + \ln 2$ C) $e^2 + e + \ln 2$ D) $e^2 - e - \ln 2$

20. $\int \dfrac{3dx}{x \cdot \ln 2x}$ ni hisoblang.

A) $3\ln 2x + C$ B) $6\ln\ln 2x + C$ C) $1,5\ln\ln 2x + C$ D) $3\ln\ln 2x + C$

21. ABC uchburchakning BC tomonida D nuqta olingan. Agar $BD = 16$, $DC = 4$ va $AB = AD = 10$ bo'lsa, ADC uchburchakning yuzini toping.

A) 12   B) 14   C) 10   D) 16

22. To'g'ri burchakli $ABCD$ trapetsiyaning B va C burchaklari to'g'ri, $AB = 8$, $BC = 6$ va $DC = 4$. Trapetsiyaning D uchidan AC diagonaligacha bo'lgan masofani toping.

A) $3,6$ B) 3   C) $2,4$ D) 2

23. $ABCD$ trapetsiyaning yuzi 48 ga teng, asoslari $DC = 6$, $AB = 2$. BC tomondan E nuqta olingan bo'lib, $BE = 2EC$ bo'lsa, ADE uchburchak yuzini toping.

A) 32   B) 18   C) 24   D) 28

24. ABC uchburchak uchlarining koordinatalari berilgan: $A(8; 12)$, $B(-8; 0)$ va $C(-2; 8)$. Uchburchakning CM medianasi yotgan to'g'ri chiziq tenglamasini tuzing.

A) $x + 2y + 3 = 0$ B) $x + y + 6 = 0$
C) $x + y = 6$ D) $x - y - 6 = 0$

25. $A = \{x : |x - 2| < 3, x \in N\}$ to'plamning elementlari sonini toping.

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

26. Quyida axborot hajmlariga tenglashtirilgan mulohazalar berilgan. Faqat rost mulohazalarning umumiy axborot hajmini toping. Agar topilgan axborot hajmi tarmoq orqali 320 sekundda uzatilgan bo'lsa, axborot uzatish tezligini megabit/sekundlarda aniqlang. «Rim sanoq sistemasidagi CXLVI son 10 lik sanoq sistemasida 146 soniga teng»=120 Mbayt; «Informatikada kompyuter texnikasi quyidagi ikki qism birligi sifatida qaraladi: Hardware va Software»=360 Mbayt.

A) *3*   B) *12*   C) *9*   D) *15*

27. Toirda 34 (8 lik sanoq sistema) dona va Zoirda bir nccha dona olma bor cdi. Zoir Toirdan 110 (2 lik sanoq sistema) dona olma oldi. Natijada ularda olmalar soni tenglashdi. Zoirda boshida 16 lik sanoq sistemasida necha dona olma bo'lgan?

A) *E*   B) *13*   C) *17*   D) *10*

28. 10 lik sanoq sistemasidagi juft sonlar barcha sanoq sistemalarida jufligini e'tiborga olib, [11; 1010] oraliqdagi barcha juft sonlar yig'indisini toping. (Barcha sosnlar 2 lik sanoq sistemasida qaraladi).

A) 111010   B) 11100   C) 11000   D) 11110

29. MS Excel. Berilgan: A1=1, C1=A1+5, A2=A1+B2, B2=МИН(A1; C1), C2=B2*B1. A2:C2 blok asosida gistogramma tuzilgan. A2 katakka mos gistogramma qismi B2 va C2 kataklarga mos gistogramma qismlarining har biridan ikki marta uzun. Shulardan kelib chiqib, quyidagi formulaning natijasini aniqlang: =3*КОРЕНЬ(B1)*A1+6*C2.

A) *9*   B) *6*   C) *24*   D) *54*

30. Quyida HTML kodining bir qismi berilgan:
`<table> <tr> <td> 102</td> <td> 51 </td> <td> -102 </td> <td rowspan=2> 102 </td> </tr> <tr> <td colspan=2> 51 </td> <td> 56 </td> </tr> </table>`. Birlashgan kataklardagi sonlar yig'indisini kataklar soniga ko'paytmasini toping.

A) *918*   B) *649*   C) *936*   D) *765*