2022 IUT Test(SBL)

<**Multiple choice Types**> There is only one correct answer per each question. Mark your answer choice on the OMR answer sheet.

For each correct answer, you will get the points indicated next to each question number.

No penalty point is applied to an incorrect answer.

1 When $12^x = 18^y = 24^z = 2$, find $\dfrac{1}{x} - \dfrac{1}{y} + \dfrac{1}{z}$.

① 1   ② 2   ③ 3   ④ 4   ⑤ 5

2 Find $\sin\dfrac{\pi}{12} + \cos\dfrac{\pi}{12}$

① $\dfrac{1}{\sqrt{2}}$ ② 1   ③ $\sqrt{\dfrac{3}{2}}$ ④ $\sqrt{2}$ ⑤ $\sqrt{\dfrac{5}{2}}$

3 $A = \begin{pmatrix} 3 & 2 \\ -1 & -1 \end{pmatrix}$ $B = \begin{pmatrix} -3 & -3 \\ 4 & 5 \end{pmatrix}$

$(A^{-1} + B)^2 = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$ $a + b + c + d$

1   2   3   4   5

4 When $\omega = \dfrac{\sqrt{3} + i}{\sqrt{2} + \sqrt{2}\,i}$, find ω^{12}.

-1 $-i$ 0 1 i

5   M m

$y = 4x^3 - 3x^2 - 6x + 2,\ (-1 \le x \le 1)$

$M + m$

$\dfrac{1}{4}$ $\dfrac{3}{4}$ $\dfrac{5}{4}$ $\dfrac{7}{4}$ $\dfrac{9}{4}$

6 Find $\displaystyle\int_1^2 x\,(x^2 - 3)^3\,dx$.

$-\dfrac{7}{8}$ $-\dfrac{9}{8}$ $-\dfrac{11}{8}$

$-\dfrac{13}{8}$ $-\dfrac{15}{8}$