


**Egypt-Japan University of Science and Technology**  
**Entrance Exam (Undergraduate)**

<b>Faculty of FIBH</b>	<b>Subject: Mathematics</b>	 <p>الجامعة المصرية اليابانية للعلوم والتكنولوجيا <b>E-JUST</b> Egypt-Japan University of Science and Technology エジプト日本科学技術大学</p>
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<b>Student Name:</b>	<b>Student ID:</b>	

**Choose the correct answer**

**Question 1:** Find the number that makes the ratio  $\frac{15}{x} = \frac{45}{180}$

- A) 60                      B) 50                      C) 75                      D) 40

**Question 2** If  $\begin{pmatrix} a & b \\ c & d \end{pmatrix} - \begin{pmatrix} 1 & -2 \\ -4 & 5 \end{pmatrix} = \begin{pmatrix} 5 & 2 \\ -3 & 5 \end{pmatrix}$ , then the value of  $a + b - c + d$  is

- A) 9                      B) 23                      C) 25                      D) 30

**Question 3** The expression  $1 + \log a + 5 \log b - 2 \log c$  simplifies to

- A)  $\log \frac{ac^5}{b^2}$                       B)  $\log \frac{2ab}{c^5}$                       C)  $\log \frac{10ab^5}{c^2}$                       D)  $\log \frac{ab^5}{c^2}$

**Question 4** If  $5x + y = 4$  and  $2x - 3y = 5$ , then the value of  $x$  is

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

**Question 5** In the triangle  $XYZ$ , assume the measure of angle  $X = \theta$  degrees, the measure of angle  $Y = 2\theta$  degrees, and the measure of angle  $Z = 3\theta$  degrees. What is the measure of angle  $Z$ ?

- A) 60                      B) 70                      C) 80                      D) 90

**Question 6** If the positive integer  $x$  leaves a remainder of 2 when divided by 6, what will the remainder be when  $x + 7$  is divided by 6?

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

**Question 7** The set of real values of  $x$  for which

$$x^2 - x - 6 < 0,$$

is:

- A)  $] -2, 3[$                       B)  $] 2, 3[$                       C)  $] 1, -3[$                       D)  $] 1, 3[$

**Question 8** Ahmed is buying tickets at the country fair. A ride on the Red wheel requires 2 ticket and a ride on the Blue wheel requires 4 tickets. He has enough money to buy a maximum of 40 tickets. Select the inequality in standard form that describes this situation. Use the given numbers and the following variables:

$x$  is the number of Red wheel rides,

$y$  is the number of Blue wheel rides.

- A)  $2x - 4y \leq 40$     B)  $2x + 4y < 40$     C)  $2x - 4y < 40$     D)  $2x + 4y \leq 40$

**Question 9** If  $f(x) = x^2 - 4x$  and  $g(x) = \sqrt{x + 2}$ . Then the domain of the function  $(f + g)(x)$  is

- A)  $\mathbb{R} - \{-2, 0, 4\}$     B)  $\mathbb{R} - \{-2\}$     C)  $\mathbb{R}$     D)  $[-2, \infty[$

**Question 10**  $\lim_{x \rightarrow \infty} \left( \frac{3x-5}{4+x} + 12^{\frac{1}{x}} \right)$

- A)  $\frac{4}{4}$     B)  $3$     C)  $0$     D) does not exist

**Question 11:** Find the midpoint of the line segment whose endpoints are  $(-3, 8)$  and  $(5, -2)$ .

- A)  $(1, 3)$     B)  $(2, 6)$     C)  $(-4, 5)$     D)  $(4, 3)$

**Question 12:** Which of the following lines is parallel to the line  $2x - 5y = 10$  ?

- A)  $y = -\frac{2}{5}x + 4$     B)  $4x - 10y = 7$     C)  $5x + 2y = 10$     D)  $2x + 5y = 10$

**Question 13:** Find the components of the directed line segment  $\overrightarrow{AB}$  if the points  $A = (1, -2)$  and  $B = (4, 3)$ .

- A)  $\langle 3, 5 \rangle$     B)  $\langle 5, 1 \rangle$     C)  $\langle -3, -5 \rangle$     D)  $\langle 5, 5 \rangle$

**Question 14:** Solve the equation  $\tan^2 x - 3 = 0$  for  $x \in [0, \pi]$ .

- A)  $\pi/6, 5\pi/6$     B)  $\pi/3, 2\pi/3$     C)  $\pi/4, 3\pi/4$     D)  $\pi/3$

**Question 15** At a party, every person shakes hands with every other person exactly once. If there are 12 people at the party, how many handshakes take place?

- A) 66    B) 132    C) 144    D) 479,001,600