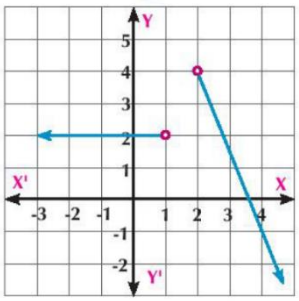
Egypt-Japan University of Science and Technology *Entrance Exam (Undergraduate)*		
Faculty of CSIT + BAS + AnD + PharmD	**Subject: Mathematics**	
Academic Year: 2026/2027	**No. of Pages: 2**	
Exam Duration: 30 min	**Exam Version: 4**	
Student Name:	**Student ID:**	

Choose the correct answer

Question 1 If $f(x) = x^2 + 5$ and $g(x) = x + 6$. What are the values x that make $(f \circ g)(x) = 30$.

A) $\{2, 5\}$ B) $\{-4, 1\}$ C) $\{-11, -1\}$ D) $\{-5, -2\}$

Question 2 The domain of the function shown in the graph is ……



A) $[0, 1]$

B) $]-\infty, 0] \cup [1, \infty[$

C) $\mathbb{R}$

D) $]-\infty, 1[\cup]2, \infty[$

Question 3 If $7^{x+1} = 3^{2x+2}$, then $x =$

A) 1 B) -1 C) 0 D) $3/2$

Question 4 The curve of $f(x) = |x + 3|$ is the same curve of $f(x) = |x|$ by translation of magnitude 3 units in the direction of

A) negative $y-$axis B) positive $y-$axis C) negative $x-$axis D) positive $x-$axis

Question 5 $\lim_{x\to 1}\left(\frac{1}{x-1} - \frac{3}{x^3-1}\right) =$ ……

A) 1 B) 0 C) $\frac{-1}{3}$ D) Does not exist

Question 6 If $\lim_{x\to 2}\frac{f(x)-8}{x-2} = 6$, then $\lim_{x\to 2}\frac{f(x)-x^3}{x-2} =$

A) 2 B) -2 C) -6 D) 6

Question 7 If $f(x) = \begin{cases} x + 1, & 1 < x < 3 \\ x^2 + ax + c, & x \in \mathbb{R} -]1, 3[\end{cases}$ is continuous on $x = 0$, then $a + c =$ ……

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

Question 8 Two ships leave the port at the same time. Ship A travels at 10 km/h, and Ship B travels at 15 km/h. The angle between their paths is 120°. How far apart are they after 2 hours?

A) $10\sqrt{19}$ km B) $20\sqrt{7}$ km C) 30 km D) 50 km

Question 9 Which term is the first negative term in the sequence: 50, 46, 42, 38, ...?

A) 12th B) 13th C) 14th D) 15th

Question 10 What is the sum of all the even numbers from 2 to 100 inclusive?

A) 2500 B) 2550 C) 5050 D) 5100

Question 11 How many 3-letter codes can be formed from the letters A, B, C, D, E if no letter may be used more than once?

A) 15 B) 60 C) 120 D) 125

Question 12 If $y = (2x^4 + 12)^7$, then $\frac{dy}{dx}$ equals to

A) $7(2x^4 + 12)^6$ B) $56(2x^4 + 12)^6$ C) $7x^3(2x^4 + 12)^6$ D) $56x^3(2x^4 + 12)^6$

Question 13 If $y = \left(\frac{x-1}{x+1}\right)^5$, then $\frac{dy}{dx}$ equals to

A) $\frac{10(x-1)^4}{(x+1)^6}$ B) $5\left(\frac{x-1}{x+1}\right)^4$

C) $-5\left(\frac{x-1}{x+1}\right)^4$ D) $\frac{2(x-1)^4}{(x+1)^5}$

Question 14 Evaluate following integration $\int (2x-2)^{-4} dx$

A) $-\frac{1}{3}(2x-2)^{-3}$ B) $-\frac{1}{2}(2x-2)^{-3}$

C) $-\frac{1}{6}(2x-2)^{-3}$ D) $-\frac{1}{6}(2x-2)^{-5}$

Question 15

From the top of a tower 40 meters high, the angles of depression to the top and bottom of a vertical flagpole standing on the same horizontal plane are 30° and 60°, respectively. Find the height of the flagpole.

A) $40/3$ B) $80/3$ C) $100/3$ D) $130/3$

Best Wishes for all