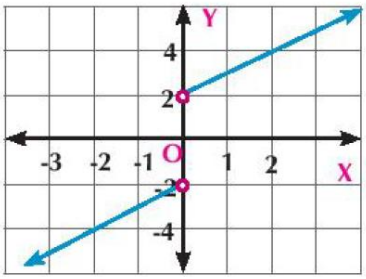
Egypt-Japan University of Science and Technology *Entrance Exam (Undergraduate)*	
Faculty of CSIT + BAS + AnD + PharmD	**Subject: Mathematics**
Academic Year: 2026/2027	**No. of Pages: 2**
Exam Duration: 30 min	**Exam Version: 5**
Student Name:	**Student ID:**

Choose the correct answer

Question 1 The range of the function in the given figure is.....



A) $\mathbb{R}$

B) $\mathbb{R}-\{-2,2\}$

C) $\mathbb{R}-]-2,2[$

D) $\mathbb{R}-[-2,2]$

Question 2 The curve of the function $f: f(x)=x^2+4$ is the same curve of the function $g: g(x)=x^2$ by translation of a magnitude 4 units in the direction of

A) positive x-direction B) positive y-direction C) negative y-direction D) negative x-direction

Question 3 If $y=\sqrt[3]{x}$ for each $x \geq 0$, then the inverse function of $y=$ ……

A) x^{-3} B) 3^x C) x^3 D) $\frac{1}{\sqrt[3]{x}}$

Question 4 If k, h are the roots of the equation: $2x^2-25x+18=0$, , then the value of $\log_3 k+\log_3 h=$ …….

A) 2 B) 9 C) $\frac{25}{2}$ D) $\log_3\left(\frac{25}{2}\right)$

Question 5 $\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}=$ ……

A) 0 B) -4 C) -2 D) 4

Question 6 If f is a function, then it is continuous at $x=a$ if

A) $\lim_{x\to\infty} f(x)$ exists B) $f(a)$ exists C) $f(a)=f(a^-)=f(a^+)$ D) (A) and (B) together

Question 7 In triangle ABC, if $a^2=b^2+c^2+bc$, what is the measure of angle A?

A) $60°$ B) $120°$ C) $150°$ D) $135°$

Question 8 If $x+2$, $3x-1$, and $4x+1$ are consecutive terms of an arithmetic sequence, what is the value of x?

A) 2 B) 3 C) 4 D) 5

Question 9 The product of the first three terms of a geometric sequence is 216. What is the value of the 2nd term?

A) 4 B) 6 C) 8 D) 36

Question 10 A ball is dropped from a height of 10 meters. Each time it bounces, it rebounds to 80% of its previous height. What is the total vertical distance the ball travels before coming to rest?

A) 40 meters B) 50 meters C) 80 meters D) 90 meters

Question 11 A multiple-choice test has 5 questions. Each question has 4 options. How many different ways can the test be answered?

A) 20 B) 120 C) 625 D) 1024

Question 12 If $y = \sqrt{(5x^2 + 12)^3}$, then $\frac{dy}{dx}$ equals to

A) $5x\sqrt{5x^2 + 12}$ B) $15x\sqrt{5x^2 + 12}$ C) $10x\sqrt{5x^2 + 12}$ D) $15x\sqrt{(5x^2 + 12)^2}$

Question 13 If $y = \frac{\cos(x)}{x+2}$, then $\frac{dy}{dx}$ equals to

A) $\frac{-(x+2)\sin(x) - \cos(x)}{(x+2)^2}$ B) $\frac{-(x+2)\sin(x) + \cos(x)}{(x+2)^2}$

C) $\frac{(x+2)\sin(x) + \cos(x)}{(x+2)^2}$ D) $\frac{(x+2)\sin(x) - \cos(x)}{(x+2)^2}$

Question 14 Evaluate following integration $\int (3x + 1)^2 dx$

A) $\frac{1}{3}(3x+1)^2 + c$ B) $\frac{1}{9}(3x+1)^3 + c$

C) $\frac{1}{9}(3x+1)^2 + c$ D) $\frac{1}{3}(3x+1)^3 + c$

Question 15

A tower 55 meters high stands on level ground. From the top of the tower, the angles of depression to the top and bottom of a vertical mast on the same horizontal plane are 30° and 60°, respectively. Find the height of the mast.

A) 35/3 B) 55/3 C) 110/3 D) 170/3

Best Wishes for all