


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

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| <b>Faculty of CSIT + BAS + AnD + PharmD</b> | <b>Subject: Mathematics</b> | <br>الجامعة المصرية اليابانية للعلوم والتكنولوجيا<br><b>E-JUST</b><br>Egypt-Japan University of Science and Technology<br>エジプト日本科学技術大学 |
| <b>Academic Year: 2026/2027</b>             | <b>No. of Pages: 2</b>      |   |
| <b>Exam Duration: 30 min</b>                | <b>Exam Version: 3</b>      |   |
| <b>Student Name:</b>                        | <b>Student ID:</b>          |   |

**Choose the correct answer**

**Question 1** Which of the following functions is one-to-one?

- A)  $x^2 - 5x$       B)  $3x + 4$       C)  $x^4 + 3x^2$       D)  $|x + 2|$

**Question 2** If  $f(x) = 3x + 1$  and  $g(x) = x^3$ . Then  $(f \circ g)(4)$

- A) 77      B) 832      C) 37      D) 193

**Question 3** The expression  $\frac{2 \log 3}{\log 9 + \log 2}$  is equivalent to .....

- A)  $\frac{1}{2}$       B)  $\log_{18} 3$       C)  $\log_{18} 9$       D)  $\log_2 9$

**Question 4** If  $f$  is an odd function, then  $\frac{3f(-4) - 5f(4)}{6f(-4)} = \dots\dots\dots$

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

**Question 5** The value of  $\lim_{x \rightarrow 0} \frac{\tan(4x)}{2x}$  is

- A) 1/2      B) 0      C) 0.2      D) 2

**Question 6** If  $f(x) = \begin{cases} \frac{(x+2)^2 - 16}{x}, & x \neq 0 \\ m, & x = 0 \end{cases}$  is continuous at  $x = 0$ , then  $m = \dots\dots\dots$

- A) 0      B) 1      C) -4      D) 4

**Question 7** In triangle PQR,  $p = 4$ ,  $q = 6$ , and  $r = 8$ . What is the value of  $\cos R$ ?

- A)  $-1/4$       B)  $1/4$       C)  $-1/2$       D)  $1/2$

**Question 8** The 3<sup>rd</sup> term of an arithmetic sequence is 14, and the 8th term is 39. What is the common difference?

- A) 4      B) 5      C) 6      D) 7

**Question 9** The sum of the first  $n$  terms of an arithmetic series is given by  $S_n = 2n^2 + 3n$ . What is the 5th term of this series?

- A) 21      B) 25      C) 35      D) 65

**Question 10** If  $x$ ,  $x + 3$ , and  $x + 9$  are three consecutive terms of a positive geometric sequence, what is the value of  $x$ ?

A) 1

B) 2

C) 3

D) 4

**Question 11** An infinite geometric series has a sum of 12 and a first term of 8. What is the common ratio?

A) 1/3

B) 1/2

C) 2/3

D) 3/4

**Question 12** If  $y = (2x^2 - 4x)^3$ , then  $\frac{dy}{dx}$  equals to

A)  $(x - 1)(2x^2 - 4x)^2$

B)  $12(x - 1)(2x^2 - 4x)^2$

C)  $(x + 2)(2x^2 - 4x)^2$

D)  $3(x - 1)(2x^2 - 4x)^2$

**Question 13** Evaluate following integration  $\int 6(3 - 2x)^5 dx$

A)  $-\frac{1}{2}(3 - 2x)^6 + c$

B)  $(3 - 2x)^6 + c$

C)  $(3x - x^2)^5 + c$

D)  $-2(3 - 2x)^6 + c$

**Question 14** Evaluate following integration  $\int 3x^2 + \frac{1}{\sin^2(x)} dx$

A)  $x^3 + \cot(x) + c$

B)  $x^3 - \cot(x) + c$

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

D)  $x^3 - \frac{1}{\sin(x)} + c$

**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  $30^\circ$  and  $60^\circ$ , respectively. Find the height of the mast.

A) 35/3

B) 55/3

C) 110/3

D) 170/3

**Best Wishes for all**