

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

Faculty of FIBH

Subject: Mathematics

Academic Year: 2026/2027

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Exam Duration: 30 min

Exam Version: 4

Student Name:

Student ID:



**Choose the correct answer**

**Question 1** Mr. Sameh received his electricity bill last month. The bill shows that Mr. Sameh pays 100 L.E as a basic amount and 0.5 L.E per one kilowatt consumed. The total bill of the last month was 850 L.E. How many kilowatt did he consume?

- A) 700                      B) 800                      C) 1000                      D) 1500

**Question 2** If the area of a triangle is 17.5 and its base is 7, what is the length of the altitude to that base?

- A) 5                          B) 6                          C) 7                          D) 8

**Question 3** The intersection point between the two lines  $2x - 3y + 1 = 0$  and  $6x - 2y - 4 = 0$  is:

- A) (1,1)                      B) (1,2)                      C) (2,1)                      D) (2,2)

**Question 4** If  $A = \begin{pmatrix} 1 & 0 \\ 2 & -1 \end{pmatrix}$ ,  $B = \begin{pmatrix} -2 & -3 \\ 0 & 1 \end{pmatrix}$ , then  $A + 3B$  equals:

- A)  $\begin{pmatrix} 5 & 9 \\ -2 & -2 \end{pmatrix}$                       B)  $\begin{pmatrix} -5 & -9 \\ 2 & 2 \end{pmatrix}$                       C)  $\begin{pmatrix} -5 & 9 \\ 2 & -2 \end{pmatrix}$                       D)  $\begin{pmatrix} 5 & -9 \\ -2 & 2 \end{pmatrix}$

**Question 5** If  $x^2 - 16 = (x - a)(x + a)$ , then  $a$  equals:

- A) 4                          B)  $\pm 4$                           C) 16                          D)  $\pm 16$

**Question 6** The set of real values of  $x$  for which  $10 - 2x^2 > 2$ , is:

- A)  $] - 2, 2[$                       B)  $] - 3, 3[$                       C)  $] - 4, 4[$                       D)  $] - 5, 5[$

**Question 7** The expression  $2 \log a - \log b - 3 \log c$  simplifies to:

- A)  $\log \frac{a^2}{b+c^3}$       B)  $\log \frac{a^2}{bc^3}$       C)  $\log \frac{2a}{3bc}$       D)  $\log \frac{2a}{b+3c}$

**Question 8:** A vector  $\mathbf{v}$  has an  $x$ -component of 5 and a magnitude of 13. What is the positive  $y$ -component of the vector?

- A) 8      B) 10      C) 12      D) 144

**Question 9**  $\lim_{x \rightarrow 1} \left( \frac{1}{x-1} - \frac{3}{x^3-1} \right) =$

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

**Question 10:** If the point  $P(x, y)$  divides the segment from  $A(1, 1)$  to  $B(4, 4)$  externally in the ratio 2:1, find  $P$ .

- A) (2, 2)      B) (3, 3)      C) (7, 7)      D) (-2, -2)

**Question 11:** A population of bacteria doubles every hour. If there are initially 50 bacteria, how many will there be after 6 hours?

- A) 300      B) 1600      C) 3200      D) 6400

**Question 12** Express the recurring decimal 0.4444... as a fraction using infinite geometric series.

- A)  $\frac{2}{5}$       B)  $\frac{4}{9}$       C)  $\frac{4}{10}$       D)  $\frac{4}{11}$

**Question 13** 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 14:** Two similar polygons have areas of  $16 \text{ cm}^2$  and  $25 \text{ cm}^2$ . What is the ratio of their corresponding perimeters?

- A) 16:25      B) 25:16      C) 4:5      D) 5:4

**Question 15**

Which of the following is equivalent to  $\frac{1 - \sin^2 x}{\csc^2 x - 1}$ ?

- A)  $\sin^2 x$       B)  $\cos^2 x$       C)  $\tan^2 x$       D)  $\cot^2 x$