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: 2**	
Student Name:	**Student ID:**	

Choose the correct answer

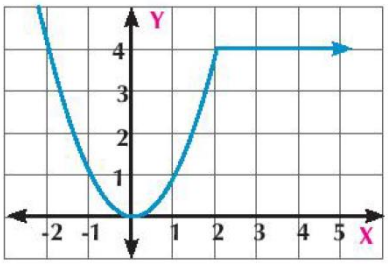
Question 1 If the velocity v(t) of a motorcycle is given by

$$\mathrm{v}(t) = \begin{cases} 4t^2 & \text{when} \quad 0 \le t \le 5 \\ 100 & \text{when} \quad 5 < t < 100 \\ -5t + 600 & \text{when} \quad 100 \le t \le 220 \end{cases}$$

where t is time in second and v is in cm/sec. Then $\mathrm{v}(75) = \cdots$

A) 22500 B) 225 C) 100 D) 345

Question 2 The function shown in the graph is increasing on ……..



A) $[0, 2]$

B) $]-\infty, 0]$

C) $[2, \infty]$

D) $\mathbb{R}$

Question 3 $f(x) = \frac{1}{x}$ then the symmetric point of the function whose rule $g(x) = f(x-1)$ is ……

A) $(0, 1)$ B) $(-1, 0)$ C) $(0, 0)$ D) $(1, 0)$

Question 4 If $f(x) = 3^x$, then the value of x which satisfies $f(x+1) - f(x-1) = 72$ equals …….

A) 4 B) 3 C) 2 D) 9

Question 5 $\lim_{x \to 0} \frac{x^2 + \sin 5x}{3\, x \cos 4x} =$…….

A) -2 B) 0 C) $\frac{5}{3}$ D) dose not exist

Question 6 $\lim_{x \to \infty} \frac{4x^{-3} + 4x^{-2} + 6}{x^{-3} - 2x^{-1} - 5} =$…….

A) 4 B) $\frac{1}{4}$ C) 0 D) $\frac{-6}{5}$

Question 7 In triangle PQR, $p = 8$ cm, $q = 12$ cm, and angle P is 30°. What is the value of $\sin Q$?

A) 0.50 B) 0.65 C) 0.75 D) 0.85

Question 8 In triangle ABC, side $a = 5$, side $b = 7$, and angle C is 60°. What is the length of side c?

A) $\sqrt{39}$ B) $\sqrt{109}$ C) 6 D) $\sqrt{74}$

Question 9 How many terms are in the arithmetic sequence: $-5, -1, 3, \ldots, 83$?

A) 21 B) 22 C) 23 D) 24

Question 10 Find the sum of the infinite geometric series: $10 + 5 + 2.5 + 1.25 + \ldots$

A) 15 B) 17.5 C) 20 D) 25

Question 11 A lock requires a 4-digit PIN. How many PINs are possible if digits can be repeated but the PIN cannot start with a 0?

A) 5,040 B) 9,000 C) 10,000 D) 10,080

Question 12 For $f(x) = x^3 - 5x - 4$, find the value(s) of x where the slope of the tangent equals to 7.

A) 1 and 3 B) 0.5 C) -2 and 2 D) $\sqrt{12}$ and $-\sqrt{12}$

Question 13 If $y = (x+2)^5(2x+7)^9$, then $\frac{dy}{dx}$ equals to

A) $9(x+2)^5(2x+7)^8 + 5(2x+7)^9(x+2)^4$ B) $18(x+2)^5(2x+7)^8 - 5(2x+7)^9(x+2)^4$

C) $18(x+2)^5(2x+7)^8 + 5(2x+7)^9(x+2)^4$ D) $9(x+2)^5(2x+7)^8 - 5(2x+7)^9(x+2)^4$

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

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

C) $4x^3 + 3x - \frac{3}{x^2} + c$ D) $x^3 + 12x - \frac{12}{x} + c$

Question 15

The angle of elevation of the top of a building from a point 50 m away from its base is 60°. A person standing on top of this building looks down at a car parked on the same horizontal line at an angle of depression of 30°. How far is the car from the base of the building?

A) 25 m B) 75 m C) 100 m D) 150 m

Best Wishes for all