2018年度日本政府(文部科学省) 奨学金留学生選考試験

QUALIFYING EXAMINATION FOR APPLICANTS FOR JAPANESE GOVERNMENT (MEXT) SCHOLARSHIPS 2018

学科試験 問題

EXAMINATION QUESTIONS

(専修学校留学生)

SPECIALIZED TRAINING COLLEGE STUDENTS

数学

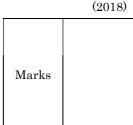
MATHEMATICS

注意☆試験時間は60分。

PLEASE NOTE: THE TEST PERIOD IS 60 MINUTES.

MATHEMATICS

Nationality		No.	
Name	(Please print full name, underlining family name)		



Note that all the answers should be written on the answer sheet.

- 1. Fill in the following blanks with the correct answers.
- (1) $\log_5 0.008 = \boxed{1}$, $(\sqrt[6]{16})^3 = \boxed{2}$.
- (2) $\sin 75^{\circ} + \sin 120^{\circ} \cos 150^{\circ} + \cos 165^{\circ} = \boxed{}$
- (3) $\frac{1}{3 \cdot 6} + \frac{1}{6 \cdot 9} + \frac{1}{9 \cdot 12} + \frac{1}{12 \cdot 15} = \Box$
- (4) The number of integers x that satisfy the following inequalities $-x < x^2 < 6$ is
- (5) Among four-digit integers where digits are all different numerals, the total possible number of integers that are greater than or equal to 5000 is | .
- (6) When $\vec{a} + \vec{b} + \vec{c} = \vec{0}$ and $|\vec{a}| = |\vec{b}| = |\vec{c}| = 1$, then the degree measure of the angle between \vec{a} and \vec{b} is $\boxed{\bigcirc}$ and $|\vec{a} - \vec{b}| = \boxed{\bigcirc}$.
- (7) In the progression 3, 4, 6, 10, 18,, the numeral of the 8th term ① |, and the number of term that is 1026 is | ②
- (8) Let $f(x) = x^2 4x + 1$.
 - (i) f(-2) =_____.
 - (ii) If f(x) = 0, $x = \boxed{\bigcirc}$ or $x = \boxed{\bigcirc}$. (\bigcirc)
 - (iii) The area bounded by the parabola y = f(x) and the x-axis is [
- (9) In a space with a coordinate system, there are three points A(0,1,1), B (-1,-1,2) and C (2,3,1). The area of $\triangle ABC$ is

2. A quadrangle ABCD which is inscribed in a circle on a plane satisfies 2AB=AC, $BC=\sqrt{3}$, BD=DC and $\angle BAC = 60^{\circ}$.

Fill in the following blanks with the correct numbers.

- (1) The radius of the circumscribed circle of the quadrangle ABCD=
- $(2) AC = \boxed{}.$
- $(3) \angle BDC = \bigcirc$.
- (4) The area of $\triangle BDC = \boxed{}$.
- (5) The scalar product of two vectors $\overrightarrow{DC} \cdot \overrightarrow{CA} = \overrightarrow{DC}$
- 3. On the plane xy, the graph of the parabola $y = ax^2 + bx + c$ is shown in the figure below. Judge whether the following expressions are larger than or smaller than zero. Fill in the blanks with the correct marks; > or <.
- (1) a = 0 (2) $4ac b^2 = 0$
- (3) a+b+c 0 (4) 4a-2b+c 0
- (5) $\frac{c}{a}$ 0 (6) $\frac{b}{a}$ 0
- (7) b + 4a 0 (8) 2a + b 0

