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# ONDOKUZ MAYIS UNIVERSITY INTERNATIONAL STUDENT EXAM

May 22, 2021

NAME	
SURNAME	:
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SIGNATURE	: SEAT NUMBER:

IMPORTANT INFORMATION				
<ol> <li>This booklet includes test questions for international students who wish to study in certain Turkish universities.</li> </ol>	<ol> <li>Each question has only one correct answer. Multiple selections will be considered as incorrect.</li> </ol>			
The number of questions are as follows:	<ol> <li>The answers to the questions given in the booklet should be marked by pencil on the answer sheet provided with this booklet. Please</li> </ol>			
Mathematics 40	use a pencil. Do not fold the answer sheet and do			
Basic Learning Skills 40	not write anything not required on it.			
<ol> <li>This is an "A" type booklet. Please mark the type of your booklet on the answer sheet as shown below, and make sure it has been confirmed by the exam supervisor.</li> <li>If you do not code the booklet type correctly on the answer sheet, your exam will be</li> </ol>	<ol> <li>Inappropriate markings on the answer sheet will not be read by the optical reader. The candidate is responsible for the mistakes incurred by inappropriate markings.</li> <li>Only correct answers will be calculated in this exam. You will not lose any points for incorrect</li> </ol>			
invalid.	answers.			
3. You have <b>120 minutes</b> to complete the exam.	<ol> <li>Further information about the examination rules are printed on the back cover of this booklet.</li> </ol>			

TYPE OF THE QUESTION BOOKLET		
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# MATHEMATICS

 $\square$ 

- 1. The 30<sup>th</sup> odd number and 51<sup>st</sup> even number after 75 are the heights of Ahmet and Mehmet respectively. How tall Mehmet from Ahmet?
  - **A)** 31 **B)** 33 **C)** 36
    - **D**) 38 **E**) 41

3. Let  $x, y \in \mathbb{Z}$ .

How many distinct y exists satisfying the

equation 
$$|x^2 - 8x + 18| + |y - 3| = 5$$
?

**D)** 6

**E)** 7

2. Let *a*, *b*, *c* be distinct positive integers.

If  $\frac{a-b}{b} > 7$ ,  $\frac{b+c}{c} < 8$ , then what is the minimum value of a+b+c?

**A)** 9 **B)** 12 **C)** 15

**D**) 20 **E**) 27

4. Let *a* and *b* be positive integers.

If  $118! + 119! = 5^a b$ , then what is the maximum value of a?

**D**) 27 **E**) 28

5. If 
$$\frac{6}{1+c^x} + \frac{1}{1+c^{-x}} = y$$
, then what is  
 $\frac{11}{1+c^x} + \frac{1}{1+c^{-x}}$  in terms of  $y$ ?  
A)  $2y - 1$  B)  $2y$  C)  $2y + 1$   
D)  $3y$  E)  $3y + 1$   
6.  $A = \{x \in \mathbb{R} \mid \sqrt{1+x} + \sqrt{2+x} + \sqrt{3+x} = 0\} = ?$   
A)  $\emptyset$  B)  $\{1,2,3\}$  C)  $\{-1,-2,-3\}$   
D)  $\{-1\}$  E)  $\mathbb{R}$   
(7.  $\frac{2}{\sqrt[3]{25} + \sqrt[3]{5} + 1} - \frac{3}{\sqrt[3]{25} - \sqrt[3]{5} + 1}} = ?$   
A)  $-2$  B)  $-1$  C)  $0$   
D)  $1$  E)  $2$   
(8. Which one of the following is a factor of  $x^3 + 3x^2 + 4$ ?  
A)  $x^2 + 2$   
B)  $x^2 - 2$   
C)  $x^2 + x - 2$   
D)  $x^2 - x - 2$   
E)  $x^2 - x - 2$ 

A

- 9. If  $a^{3}+3=0$ , then what is  $\frac{1}{a^{2}-a+1}$  in terms of a?
  - A)  $-\frac{a+1}{2}$  B)  $\frac{a-1}{3}$  C)  $\frac{a-2}{2}$

**D**) 
$$\frac{a+2}{2}$$
 **E**)  $a+1$ 

11. Which one of the following is true for  $A = \{x \in \mathbb{R} \mid x = 2k, k \in \mathbb{Z}\}$   $B = \{x \in \mathbb{R} \mid |1 - x| + |2 - x| > x + 3\}$ 

Α

$$C = \left\{ x \in \mathbb{Z} \mid (0, 25)^{3-x} = 4^{5-3x} \right\}$$



10. For which value of y, x <u>can not be found in</u>

$$5x-3y+xy-15=0$$
?  
A) -7 B) -5 C) 0  
D) 2 E) 3

12. 
$$h(ad) = h(a) + h(d)$$
  
 $\frac{h(a^4)}{h(\sqrt[4]{a})} = ?$   
A) 12 B) 16 C) 20

**D**) 24

**E)** 28

### a following is two for

**Mathematics** 

- r )

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13. 
$$h(3^{x} + 3^{x}) = 9^{x} + 9^{x} - 2$$
  
 $f(x^{3} + 4) = 1 - 4x$   
 $(foh)(-4) = ?$   
A) - 12 B) -9 C) -7  
D) 7 E) 9  
14.  
 $y = a^{x}$   
 $y = d^{x}$   
 $y = d^{x}$ 

What is the right order for *a*, *d*, *f* according to given exponential functions?

- $\mathbf{A}) f > d > a \qquad \qquad \mathbf{B}) d > a > f$
- **C**) a > f > d **D**) a = f = d

**E**) 
$$a = d > f$$

of x satisfying  $3x + 7 \equiv 12 \pmod{29}$ ?

Α

**D)** 0 **E)** 13

16. If one wants to buy last floor of a building with 13 floors he/she must buy 12<sup>th</sup> floor.

How many different ways of buying 8 floors of this building?

A) 729	<b>B)</b> 824	<b>C)</b> 957
,		,

**D)** 1024 **E)** 1287

### ONDOKUZ MAYIS UNIVERSITY YÖS

17. Efe, Mete and Ege choose one card each from a box containing cards numbered from 1 to 9 and play a game.

If the total of their card numbers is a prime, then Efe wins. It is known that card number of Efe is 3.

What is the probability for Efe to win?

A) 
$$\frac{2}{7}$$
 B)  $\frac{16}{27}$  C)  $\frac{17}{28}$   
D)  $\frac{19}{42}$  E)  $\frac{17}{56}$ 

19. For the polynomial P(x) we have P(1) > 0, P(2) < 0 and P(3) > 0.

### Which one of the following is <u>always</u> true?

- I. There is at least one root between 1 and 2.
- II. There are more than one root between 2 and 3.
- III. There are two roots between 1 and 3.

A) Only I B) Only II C) I and II

**D**) II and III **E**) I, II and III

18. Let  $x_1, x_2$  be the roots of

$$(4a^2 - 19a - 5)x^2 + a^2x + a + 3 = 0$$

Which one of the following is the

interval for a satisfying  $x_1 < 0$  ,  $x_2 > 0$  and  $|x_1| - x_2 > 0$  ?

A)  $\left(-\frac{1}{4}, 5\right)$ B)  $\left(-\infty, -3\right)$ C)  $\left(5, +\infty\right)$ D)  $\left(-3, -\frac{1}{4}\right) \cup \left(5, +\infty\right)$ E)  $\left(0, 5\right)$  20. The roots of  $2m^2 - 7m - 1 = 0$  are  $\cot x$  and  $\cot y$ .

$$\frac{\cot x + \cot y}{1 - \tan x \tan y} = ?$$
A)  $-\frac{7}{2}$ 
B)  $-\frac{7}{6}$ 
C)  $\frac{2}{7}$ 
D)  $\frac{7}{6}$ 
E)  $\frac{7}{2}$ 

#### **Mathematics**

21.

**C**) 3

**E)** 6



Α

**B**) 1

24. Let  $F_n + F_{n+1} = F_{n+2}$ ,  $F_1 = F_2 = 1$  be a Fibonacci squence.

If a+b+c+d = 1364 and a+d = 754 for consecutive terms a, b, c, d of this squence,

**B)** 55 **C)** 144

> **D)** 377 **E)** 610

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 $\stackrel{\bigtriangleup}{\operatorname{ABC}}$  and  $\stackrel{\bigtriangleup}{\operatorname{DEF}}$  are right triangles.

$$\lim_{\beta \to 0} \frac{|\mathbf{DF}| \cdot |\mathbf{AB}| - |\mathbf{EF}|}{|\mathbf{BC}|} = ?$$
  
A) - 2 B) - 1 C) 0 D) 1 E) 2

- Mathematics
- 27. How many points c exist for the function

Α

$$g(x) = \frac{-3}{(x-1)^2 (x+3)^3 (x-3)^2 (x-5) (x-4)^2}$$

where g has a limit at c but not continuous at c?

### **26.** The function

$$f(x) = \begin{cases} b \frac{|x-1|}{x-1} + 1, & x \in (-\infty, 1) \cup (1, 2) \\ x^2 + a & , & x \in (2, +\infty) \end{cases}$$

has a limit for every  $x \in \mathbb{R}$ . a + b = ?

**D**) 0

**A**) -3 **B**) -2 **C**) -1

**E)** 1

**28.**  $\cos 10^{\circ} \cos 20^{\circ} \cos 40^{\circ} = ?$ 

A) 
$$\frac{1}{4} \cot 10^{\circ}$$
  
B)  $\frac{1}{4} \tan 10^{\circ}$   
C)  $\frac{1}{8} \tan 10^{\circ}$   
D)  $\frac{1}{8} \cot 10^{\circ}$   
E)  $\frac{1}{4} \cos 10^{\circ}$ 

29. 
$$f : \mathbb{R} \to \mathbb{R}$$
$$(\cos x)' = -\sin x$$
$$f(x) = \sqrt[3]{x-1} (1 - \cos(x-1))$$
$$f'(1) = ?$$

A) Does not exist B) -1 C) 0

**D)** 1

**E)** 2

Α

31.  $f(x) = \begin{cases} x+1, & x < 0 \\ x^2, & x \ge 0 \end{cases}$   $\int_{1}^{3} f(x-2) dx = ?$ A) 0 B)  $\frac{1}{12}$  C)  $\frac{1}{6}$ D)  $\frac{2}{3}$  E)  $\frac{5}{6}$ 

**30.** What is the product of x satisfying the equation  $x^{\log_3 x} = 6561x^7$ ?

A) 
$$\frac{1}{3^7}$$
 B)  $\frac{1}{3^6}$  C)  $3^6$   
D)  $3^7$  E)  $3^8$ 

32. Let y = f(x) be a continuous function with period 3 and  $\int_{0}^{6} f(x) dx = 8$ .  $\int_{-1}^{14} f(x) dx = ?$ A) 40 B) 20 C) 10 D) 8 E) 4 ONDOKUZ MAYIS UNIVERSITY YÖS





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### Mathematics





It is known that sun rises at 7.30 and sunsets at 22.30.

Sun follows a trace of half circle.

According to the position of sun at 15.30, what is x = ?



**D)** 124°

**E)** 144°

38.



In the circle segments with center O,

|OD| = 3 units, |OA| = 8 units

Area(OCD)=27 units square.

Area(ABDC) = x = ?

**A)** 105

**C)** 165

**D)** 195 **E)** 225

**B)** 135



K, L, M, N are the midpoints of base edges of the quadrangular and T is a point on the floor.

What is the ratio of the volume of the pyramid (T, KNML) to the volume of the quadrangular?

A) 
$$\frac{1}{6}$$
 B)  $\frac{1}{3}$  C)  $\frac{1}{2}$   
D) 2 E) 6

Mathematics Test is completed.

40.

Α

## **BASIC LEARNING SKILLS**

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Α





**B)** 8

# Solve questions 9-10 according to explanation below.

	I.	II.	III.	
1.				Nu
2.				pla
3.	11			suc
4.	12		10	(I,

**A)** 9

Numbers from 1 to 9 are placed in the empty boxes such that the sum of columns [I, II, III] are equal.

**D)** 6

**E)** 4

Α

9. Which one of the following may not be on the same row with 3?

**C)** 7









Which one of the following should be replaced in the question mark (?)?



10.			9
		6	
	11		
	12		10

Which one of the following can not be the sum of the first row of the next figure?

**A)** 20 **B)** 19 **C)** 18 **D)** 17 **E)** 16







 $\bigcirc$ 

# Which one of the following should be replaced in the question mark (?)?





Α

?

Which one of the following should be replaced in the question mark (?)?



14.

# Which one of the following is rotated at an angle of 255° clockwise yields the above figure?





Figure 2 is obtained by deleting two parts from Figure 1. What are they?

- A) I and III B) I and VII C) III and V
  - **D**) III and VI **E**) I and V

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Which one of the following is the missing part?





Α

Which one of the following should be replaced in the question mark (?)?





Which one of the following should be replaced in the question mark (?)?



**D**) 2512 **E**) 9636



Which one of the following should be replaced in the question mark (?)?



22. SAASFRFTAASRRFTTRRAFSASAASRS FASTRFTRTATSTSSFARSTTF

Α

Which letter is the most appearing one in the above letter group?

A) A	B) F	$(\mathbf{C}) \mathbf{R}$	D) S	E) T
AJA	<b>D</b> ) Г	UΓ	DJS	E) I



Which one of the following should be replaced in the question mark (?)?



18



Δ

**D**) 43 **E**) 37

19





Δ



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**2021** INTERNATIONAL STUDENT EXAM (OMÜ YÖS)



### **EXAMINATION RULES**

**1.** Following materials are prohibited in exam room: **Mobile phones** and any communication equipments e.g. pagers, walkie-talkies, PDA's, watches with any other functions, weapons, notebooks, books, dictionaries, any electronic device with dictionary function, calculators, calculation charts, compasses, goniometers, rulers and etc. If any candidate enters the exam room with the prohibited materials, his/her name will be recorded and their examinations will be considered invalid.

2. Duration of the exam is **120** minutes. Candidates are allowed to take the exam if they are not late for more then **30** minutes. Candidates are not allowed to leave the exam room in the first **60** minutes and the last **5** minutes of the examination. Candidates who completed the exam or left the examination room will not be allowed to reenter the examination room. If you complete the exam before the end of the duration you can leave the room after submitting your question booklet and answer sheet. When the end of the examination is announced you must remain seated and may not leave the examination room until all papers are collected by the invigilators.

**3.** Communicating with the invigilators during the examination is prohibited. Similarly, it is prohibited for the staff to talk to candidates privately. Candidates are not allowed to exchange pencils, erasers, papers etc. during the exam.

**4.** The exam of any candidate who cheats, attemps to cheat or assists cheating will be considered invalid and his/her identity will be recorded. Invigilators do not have to warn the students about cheating. The candidate is responsible for his/her actions. Answers of the candidates will be examined electronically. If any suspicious case is detected regarding individual or collaborate cheating, the exams of all candidates who participate in this action will be considered invalid. If invigilators report any case of misconduct in the application of the exam or collaborate cheating, OMÜ-YÖS Coordinating Office may decide to consider all of the candidates' exams invalid for that room.

**5.** All candidates must obey the rules in the exam room. If necessary, your seat may be changed by inviligators. Obeying the rules is of utmost importance for validation of the exam. Identity of any candidate who engages in misconduct and does not heed the invigilator's warning to discontinue the behavior, will be recorded and his/her

examination will be considered invalid.

**6.** You must fill all the required fields on the answer sheet. Only pencils should be used for marking and writing on the answer sheet. Pens or ball point pens shoul not be used. All the answers should be marked on the answer sheet. Answers marked on the question booklet will be considered invalid.

7. Please check your question booklet for missing pages or typos after receiving it. If there are any missing pages or typos on your booklet, please immediately request for the change of the booklet from the head invigilator. You should also check if the booklet type written on the cover page is the same as the booklet type written on every page of the booklet. If you find any difference, please request a new booklet from the head invigilator. If you realise any difference about booklet types after you start the examination, request a new booklet of the same type you have answered. Please mark your booklet type on the "Question Booklet Type" area on the answer sheet. Booklet type you have marked will be checked by the invigilators and initialed with a pen. If the related area is not initialed, your answer sheet will not be evaluated. If there is difference between the booklet types that you have marked and the invigilator has marked, evaluation will be based on the one that is marked by invigilators.

**8.** Please write your name, surname and candidate number on the question booklet before starting to answer the questions. All the question booklets and answer sheets will be collected and examined at the end of the examination. In case of missing pages, examination of the related candidate will be considered invalid.

**9.** You can use the spaces on the question booklet for calculation.

**10.** Smoking (cigarettes, pipes, cigars etc.) is not allowed during the examination for both candidates and the staff.

**11.** Writing the questions and/or the answers and taking it out is strictly prohibited.

**12.** Do not forget to submit your question booklet and answer sheet before leaving the exam room.

Samsun, Turkey

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### **TO BE HELD IN NIGERIA**

### ANNOUNCEMENT! ANNOUNCEMENT! ANNOUNCEMENT!



We are delighted to tell Nigerians OMU YOS is to be held in Nigeria this coming year..



OMÜ-YÖS was first held on May 27, 2012, in 16 countries, and 21 exam centers, in Turkish and English and was attended by 709 candidates. There has been a significant increase in the number of countries and centers where the exam is held and the number of exam languages and attendee students. The exam of 2016 was held in 18 countries, 28 exam centers, and 6 languages (Turkish, English, Russian, Arabic, French, and German) in total. The preliminary works for OMÜ-YÖS 2017 to be conducted in 3 continents and various countries have started.

### A.S.M CONSULTANCY IS TO **ORGANIZE OMU YOS IN** NIGERIA.

ALONG WITH OMU UZEM, YOS IS PLANNED TO BE ORGANIZED IN KANO NIGERIA, NEXT YEAR IN MAY..

The number of universities accepting OMÜ-YÖS (Entrance Examination for International Students) is growing each passing day. OMÜ-YÖS is taken by international students wishing to study at Ondokuz Mayıs University, and the exam's result is accepted by 72 states, 47 private universities, and 119 universities in total. This exam is carried out under the coordinatorship of OMU International Relations Office jointly with OMU Distance Education Center (UZEM). The number of universities accepting OMÜ-YÖS (Entrance Examination for International Students) is growing each passing day. OMÜ-YÖS is taken by international students wishing to study at Ondokuz Mayıs University,



#### PRIVATE UNIVERSITIES

APPLY TO OMU YOS EXAM TO GET ADMISSION TO MORE THAN 90 UNIVERSITIES IN TURKEY. APPLY TO OMU YOS EXAM TO GET ADMISSION TO MORE THAN 90 UNIVERSITIES IN TURKEY APPLY TO OMU YOS EXAM TO GET ADMISSION TO MORE THAN 90 UNIVERSITIES IN TURKEY APPLY TO OMU YOS EXAM TO GET ADMISSION TO MORE THAN 90 UNIVERSITIES IN TURKEY APPLY TO OMU YOS EXAM TO GET ADMISSION TO MORE THAN 90 UNIVERSITIES IN TURKEY.

A.S.M Consultancy is to organize the YOS exam (JAMB) in Nigeria next year. The exam takes place during May, successful students will be admitted to their university of choice. There are more than 80 public and 50 private universities that accept the OMU YOS exam. We need 100 candidates in order to bring the exam to Nigeria. Apply here to actualize your dream of studying abroad.