WESTMINSTER
International University in Tashkent

UNIVERSITY OF WESTMINSTER

Sample of Mathematics Entrance Examination 2023

DATE:
SESSION:

1. You have 1 hour and 10 minutes for the exam.
2. Answer all questions.
3. No calculators are allowed.
4. For Open-ended questions write your answers in the spaces below the questions. Answers with no evidence of calculations will not score any marks. Workings and answers written on any other page will not be marked.

Please note additional requirements:

a) You are not allowed to leave during the first 30 minutes or the last 15 minutes of the examination.

b) You are not allowed to talk, to whisper, to turn around or to look at another candidate's examination, all of which are offences, and you will be penalized. If you commit this offence, you will be given a single written warning; after which if you commit a further offence, you will be reported to an assessment board without a right of appeal or refund of the exam administration fee.

c) You cannot borrow another student's stationery or materials.

d) If your pen runs out of ink, you may request a replacement from the invigilator. No other stationery or materials may be provided for you by the invigilator.

e) If you are found to have any unauthorized exam related materials during the examination this will constitute an offence and you will be disqualified from the exam.

f) If you are caught cheating in the examination, you will be disqualified from the exam.

g) Failure to show contents of your pockets or any other containers to the invigilators will be considered as an offence and you will be disqualified from the exam.

h) All mobile phones and other electronic devices must be switched off and left at a place indicated by the invigilators. If you are found to have a mobile phone or other electronic device (switched on or off) on you during the exam, this will be considered as unauthorized examination materials, and you will be disqualified from the exam without a right of appeal.

Applicant ID: _____

All questions on this paper must be answered.

For Multiple choice questions (1-17) select single answer choice.
For Questions 18-20 write the answers in the space below each question.
Working must be shown for all stages of the questions.

1. If $\frac{x^2-9}{x+3} = 5$, and $x \neq -3$, what is the value of x?

[2 marks]

a)	-8	b)	-3	c)	0	d)	8

2. The park is full of people walking with their dogs.
If Mary counts 45 heads and 140 legs, how many dogs are present in the park?

[2 marks]

a)	25	b)	15	c)	20	d)	30

3. Solve the equation.

$$(125^{x+1}) \times 25 = 625$$

[2 marks]

a)	-3	b)	$-\frac{1}{3}$	c)	$\frac{1}{3}$	d)	3

4. Find the smallest number that can be exactly divided by all the numbers from 1 to 10.

[2 marks]

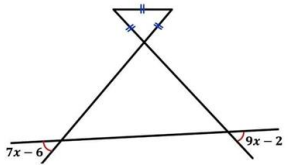
a)	4320	b)	3250	c)	5040	d)	2520

5. If $\frac{6}{3\sqrt{2}-2\sqrt{3}} = 3\sqrt{2} - a\sqrt{3}$ then find the value of a.

[2 marks]

a)	-1	b)	1	c)	2	d)	-2

6. Find the value of x.



[2 marks]

a) 5	b) 8	c) 10	d) Ø

7. Evaluate

$$\sqrt[16]{3 \times 5 \times 17 \times 257 + 1}$$

[2 marks]

a) 1	b) 2	c) 4	d) 8

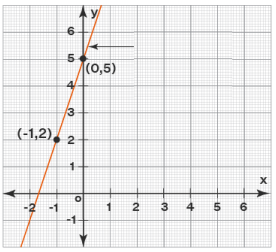
8. Simplify

$$\frac{2x-7}{5} + \frac{4x+26}{15} - \frac{2x-2}{3}$$

[2 marks]

a) 1	b) 2	c) -1	d) -2

9. Find the equation of the linear function represented by the graph below.



[2 marks]

a) $y = 3x + 5$	$b)\ y = -3x + 5$	$c)\ y = 3x - 5$	$d)\ y = 2x + 5$

10. Evaluate the value of abc, if

$$\begin{cases} a + \dfrac{3}{b} = 3 \\ b + \dfrac{1}{c} = 1 \end{cases}$$

[4 marks]

a) 3	b) -3	c) 1	d) 0

11. Given $x = \frac{p-q}{p+q}, y = \frac{q-r}{q+r}, z = \frac{r-p}{r+p}$, evaluate

$$\frac{(1-x)(1-y)(1-z)}{(1+x)(1+y)(1+z)}$$

[4 marks]

a) 4	b) 2	c) 1	d) 0

12. Let n be an integer than can be represented by $2^a 3^b 5^c$.
If a, b and c are integers such that $0 < a < b < c$, and $a + b + c = 7$, what is a possible value for n?

[4 marks]

a) 2700	b) 6750	c) 11250	d) 4500

13. Solve for x

$$\log_{10}(x+3) + \log_{10} x = 1$$

[4 marks]

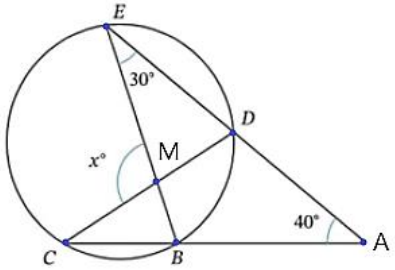
a) 2	b) -5 and 2	c) 5	d) 5 and -2

14. For the function $f(x) = ax^2 + 24$, a is a constant and $f(4) = 8$.
What is the value of $f(-4)$?

[4 marks]

a) 0	b) 8	c) -8	d) -1

15. From the figure below find angle x.



[4 marks]

a) 100^0	b) 120^0	c) 90^0	d) 110^0

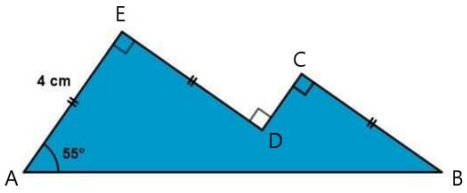
16. Solve for real x.

$$2^x + 2^{-x} = 2$$

[4 marks]

a) 2	b) 4	c) 0	d) 1

17. Find the area of the figure ABCDE, if AE=4 cm.



[4 marks]

a) $12.5\ cm^2$	b) $12\ cm^2$	c) $17.5\ cm^2$	d) $16\ cm^2$

18. Suppose a, b and c are integers satisfying the following identity.

$$\frac{1}{a} + \frac{1}{ab} + \frac{1}{abc} = 1$$

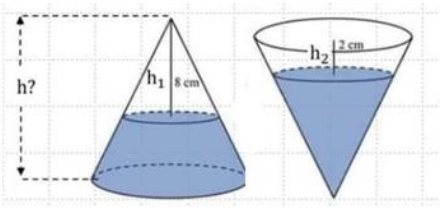
Find all ordered triples (a, b, c).

[6 marks]

19. Two circles have the same radius. The centre of the one circle is at the point M(-2, 1). The centre of the other circle is at the point N(3, -2). The circles intersect at two distinct points. What is the equation of the straight line through the two points at which the circles intersect?

[6 marks]

20. When a conical bottle rests on its flat base, the water in the bottle is 8 cm from its vertex. When the same conical bottle is turned upside down, the water level is 2 cm from the base. What is the height of the bottle?



[8 marks]