WESTMINSTER INTERNATIONAL UNIVERSITY IN TASHKENT
An Accredited Institution of the University of Westminster (UK)

UNIVERSITY OF WESTMINSTER

**ONLINE MATHEMATICS ENTRANCE EXAMINATION**

**DATE: July 14, 2020**

**TIME: 11.00-12.30**

**1. You have 1 hour and 30 minutes for the exam.**

**2. You must answer all questions.**

**3. No calculators are allowed.**

**4. Type your answers in the spaces below the questions.**

**5. Answers with no evidence of calculations will not score any marks. Workings and answers written on any other page will not be considered.**

**6. You will need a computer connected to high speed Internet and stable electricity (You cannot take online math entrance exam on mobile phone).**

**Please note additional requirements:**

7. Applicant will be automatically disqualified from the examination and will receive a score of 0 for the exam and exam administration fee payment will not be reimbursed:
   a) If he/she leaves the room during the examination.
   b) If he/she talks, whispers, or turns around.
   c) If he/she found to have any unauthorized materials during the examination
   d) If he/she caught cheating in the examination.
   e) If he /she fails to show contents of his/her pockets or any other containers to the invigilators.
   f) If he/she is found to have a mobile phone or other electronic device (switched on or off) on his/her room/table during the exam.

8. During the examination period, any technical problems including poor internet connection from applicant's side that may cause an applicant to leave the examination environment is under the applicant's responsibility.
9. Applicant *cannot* re-join the exam and continue the examination process. Once you leave the examination or you disconnect, you cannot continue the exam.
10. Invigilator may conduct room security checks at any point during your exam. You must perform all requested security checks. Loss of time during these security checks cannot be made up.
11. Please follow detailed exam instruction sent to applicant's personal account via admission system.
12. Applicant has to follow the instruction strictly during the examination.

**Applicant ID:** _____

All questions on this paper must be answered.

**Write the answers in the space below each question.**

**Working must be shown for all stages of the questions**.

1. You are ordering circular cloth patches for your soccer team's uniforms. Find the approximate circumference and area of the patch shown.

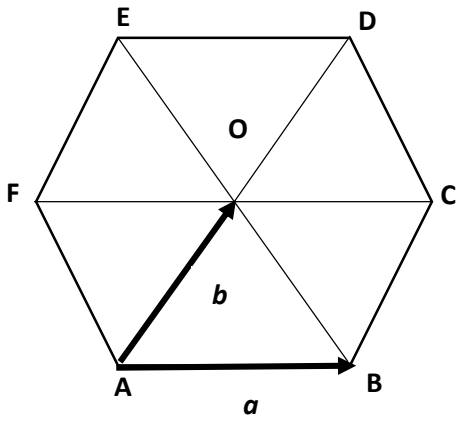

(4 marks)

2. A table is shaped like a regular hexagon. The expressions shown represent side lengths of the hexagonal table. Find the length of a side.


(4 marks)

3. ABCDEF is a regular hexagon with centre O, where two vectors are given

$$a = \overrightarrow{AB},\ b = \overrightarrow{AO}.$$



a) Express vector $\overrightarrow{AC}$ in terms of vectors **a** and **b.**

(2 marks)

b) Express vector $\overrightarrow{DC}$ in terms of vectors **a** and **b.**

(2 marks)

c) Express vector $\overrightarrow{FD}$ in terms of vectors **a** and **b.**

(2 marks)

**4.** Find the coordinates of the midpoint of the segment with the given two endpoints:

A(3, 5) and B(-7, 11).

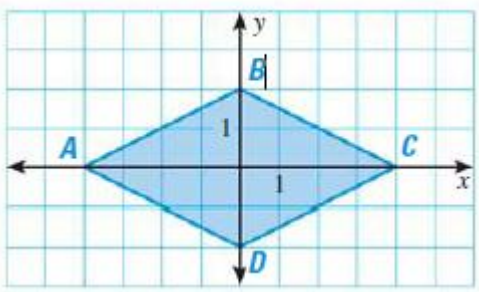
(3 marks)

**5.** Solve the equation

$$\sqrt{x-1} - x = -7$$

(4 marks)

6. Quadrilateral *ABCD is given*




a) Find the perimeter of quadrilateral *ABCD*.

(2 marks)

b) Find the area of triangle *ABC* and the area of triangle *ADB*.

(2 marks)

c) What is the area of quadrilateral *ABCD*?

(2 marks)

7. Given $3x - y = 12$, find the value of $\frac{8^x}{2^y}$.

(4 marks)

8. a) Simplify

$$\left(x - \frac{2 + x^2}{x - 1}\right) \div \frac{x^2 + 4x + 4}{1 - x}$$

(3 marks)

b) Solve the system of equations

$$\begin{cases} x - y = 2 \\ x^2 - y^2 = 28 \end{cases}$$

(4 marks)

9. Calculate (periodic numbers)

$$\frac{0.8(3) - 0.4(6)}{0.(3)}$$

(3 marks)

10. Find 6th and 7th terms of given geometric sequence:

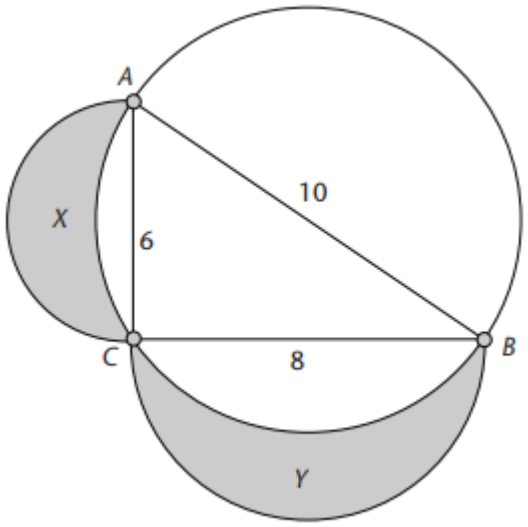
$$3, \quad 1, \quad \frac{1}{3}, \quad \ldots$$

(4 marks)

11. The total number of passengers riding a certain city bus during the morning shift is 1000. If the child's fare is \$1, the adult fare is \$2, and the total revenue from the fares in the morning shift is \$1600, how many children and how many adults rode the bus during the morning shift?

(5 marks)

12. In the figure below given right triangle ABC inscribed in a circle with AC = 6, BC = 8 and AB = 10. We construct semicircles on AC and CB. Find the sum of the areas of regions X and Y, the shaded crescents.




(6 marks)

13. a) If the cost of 6.4 grams of gold is $1376, work out the cost of 5.7 grams of gold.

(2 marks)

b) Peter saved total $2040 in 30 days, each day saving $4 more than the previous day. How much money did he save on the first and last days?

(3 marks)

14. Equations of several straight lines are given.

A. $y = -x + 1$ B. $y = \frac{2}{3}x + \frac{1}{3}$ C. $7x + 6y = 22$

D. $2y + 3x - 1976 = 0$ E. $x + y = 13$

a) Find pair of lines which are parallel

(2 marks)

b) Find pair of lines which are perpendicular

(2 marks)

c) Find one line which is nor parallel or perpendicular to any other line

(2 marks)

15. Simplify trigonometric expression (note that *tan(x)* is tangent and *cot(x)* is cotangent)

$$\frac{2}{\tan(x) + \cot(x)}$$

(3 marks)

**END OF TEST**