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

UNIVERSITY OF WESTMINSTER

ONLINE MATHEMATICS ENTRANCE EXAMINATION

DATE: 18th JUNE 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. Write down the prime factors of 273

……..

2 marks

2. A film reel runs at $1\frac{7}{8}$ cm per second

a) Work out the length of reel played in $2\frac{1}{2}$ seconds. *Give your answer as a mixed number*

……

2 marks

b) Work out how long it takes for $9\frac{3}{8}$ cm of reel to be played.

……

2 marks

3. Ann wants to make a mug in the shape of a cylinder on a 3D printer. The volume must be 510 cm^3 and the height must be 9.6 cm. Ann needs to work out the radius in centimeters.

a) Taking π = 3.14, calculate the value of the radius correct to the nearest whole number.

……..

3 Marks

b) Given that $A = 2^4 \times 3^3 \times 5$ and $B = 2^3 \times 3 \times 5^2$ write down, as a product of powers of its prime factors,

(i) The highest common factor (HCF) of A and B

(ii) The Lowest Common Multiple (LCM) of A and B

……2 marks

4 In the USA and in the UK petrol is sold in *gallons* (1 gallon = 4.55 litres). The petrol tank of a car holds 6 gallons when it is 80% full.

What is the capacity of the petrol tank in litres?

……

3 marks

5 a) Solve the equation

$$\frac{(x+1)}{2} - \frac{(2x+1)}{3} = 1$$

……

2 marks

b) Simplify

$$\frac{x^2 - 3x - xy + 3y}{x^2 - 9}$$

……..

2 marks

c) In a physics experiment there are three variables: *u, v* and *f.*

They are found in the formula $f = \frac{uv}{u+v}$. Make *v* the subject of the formula

……

2 marks

6. Here are the equations of several straight lines.

A	$y = -x + 7$	**B**	$2y = x - 7$	**C**	$4x + 12y = 5$
D	$x + 3y = 10$	**E**	$y = x - 3$	**F**	$y = 5 – 5x$
G	$5x + y = 12$	**H**	$y = 3 – 2x$	**I**	$y = 2x + 4$

a) Find <u>two</u> pairs of lines which are parallel

……2 marks

……..2 marks

b) Find <u>two</u> pairs of lines which are perpendicular (at right angles)

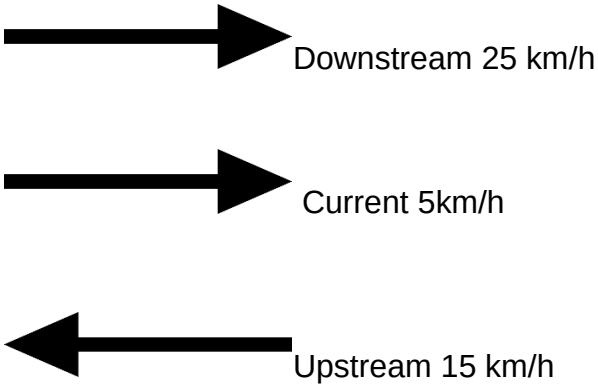
……..……..2 marks

……2 marks

c) Find <u>one</u> line which is not parallel or perpendicular to any other line

……2 marks

7. A ship travels at a speed of 20 km/h in *still* water (not moving water). When there is a *current* (moving water) in the water of 5 km/h the boat travels at 25 km/h downstream and 15 km/ h upstream.

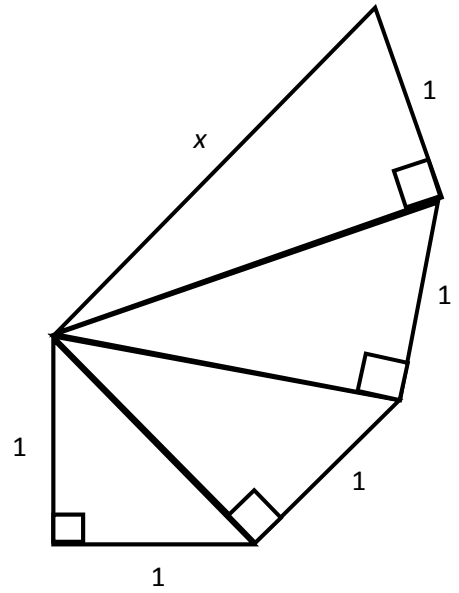


The ship only has enough fuel to last for 3 hours. The ship leaves its base and travels downstream. After how long must the ship turn around to get back to base without running out of fuel?

……

6 marks

8.



a) Look at the diagram above. All measurements given are 1 cm

Find the value of x in terms of $\sqrt{x}$

……..

3 marks

b) The diagram below shows part of a regular 10 sided polygon.

Work out the size of the angle marked x

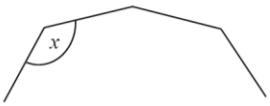


Diagram **NOT** accurately drawn

……

3 marks

9. Solve this simultaneous equation

$$3a - b = 9$$

$$2a + 2b = 14$$

x = ……2 marks

y = ……2 marks

10. a) Anya, Bella and Clara have some sweets in the ratio 2:3:7

Clara has 20 more sweets than Anya. How many sweets does Bella have?

……

3 marks

b) Ana gives 2 of her sweets to Clara. What fraction of all the sweets does Clara now have? Give your answer in the simplest form

……..

2 marks

11. a) Find the nth term for the sequence

$$1 \qquad \frac{1}{4} \qquad \frac{1}{9} \qquad \frac{1}{16}$$

……

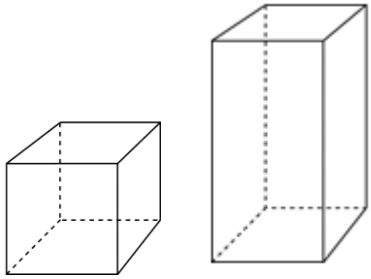
2 marks

b) Find the 20th term and express it as a decimal fraction

……

2 marks

12. A cube has a surface area of 96cm^2. A rectangle has the same sized base as the cube but is twice as high. What is the surface area of the rectangle?



……4 marks

13. a) Newtown is the capital city of Newlandia. The population of Newtown is 890,000. This population is 2.5% of the total population of Newlandia. What is the total population of Newlandia?

……

3 marks

b) George is given a 12% pay rise. His new salary is $24,080. What was George's salary before the pay rise?

……..

3 marks

14. The cost of a circular rug is directly proportional to the square of the radius.
A circular rug with a radius of 40 cm costs $500.
What is the cost of a rug with a radius of 60 cm?

……

2 marks

15. Write $0.\dot{8}\dot{1}$ as a fraction. Give your answer in its simplest terms.

……

3 marks