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

UNIVERSITY OF WESTMINSTER

ONLINE MATHEMATICS ENTRANCE EXAMINATION

DATE: 23rd 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.

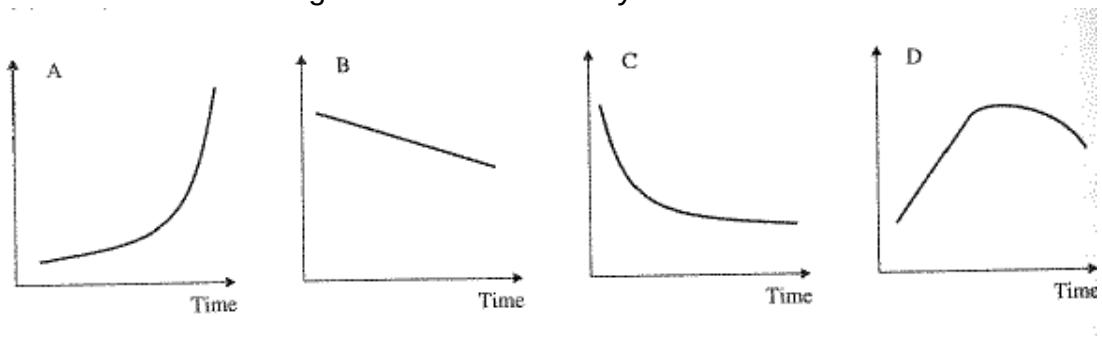
Write the answers in the space below each question.

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

1.

a) A drinks company makes four types of drink – Amazing Apple, Brilliant Banana, Crazy Coconut and Date Delight. Below are four graphs showing sales of each drink recently. Match the statement with the correct graph.

i) Sales of Amazing Apple were falling but are now steady.
ii) Sales of Brilliant Banana were rising slowly but are now rising rapidly.
iii) Sales of Crazy Coconut were rising slowly but are now beginning to fall.
iv) The sales of Date Delight have fallen steadily.



Graph A: Statement……..
Graph B: Statement……..
Graph C: Statement……..
Graph D: Statement……..

(4 marks)

b) The ratio of the sales of Amazing Apple to Crazy Coconut is 1:6 and the ratio of sales of Brilliant Banana to Crazy Coconut is 2:5.
Find the ratio of Amazing Apple : Brilliant Banana : Crazy Coconut
Give your answer in its simplest form.

(3 marks)

2.

a) If $sin2x = \frac{2}{4}$, find the value of

$$sin^4x + cos^4x.$$

(3 marks)

b) Simplify

$$\frac{1 + cos2x + cos^2x}{sin^2x}$$

(3 marks)

3.

a) Alfred has a square kitchen with an area of 9 m^2. He decides to enlarge his kitchen by a scale factor of 1.5. What will the new area of his kitchen be?
(appropriate unit must be included)

(3 marks)

b) The mass of Jupiter is 1.899×10^{27}kg. The mass of Saturn is 0.3 times the mass of Jupiter. Work out an estimate for the mass of Saturn. Give your answer in standard form. Give evidence to show whether your answer is an underestimate or an overestimate.

(5 marks)

4.

a) Given

$$8^5 \times 8^6 = 8^3 \times 8^n$$

find the value of *n.*

(2 marks)

b) Evaluate

$$(2x)^2 \times (3x)^3$$

(2 marks)

5.

Write as a single fraction in its simplest form

$$\frac{2x-8}{x^2-16} + \frac{10}{x^2+3x-4}$$

(5 marks)

6.

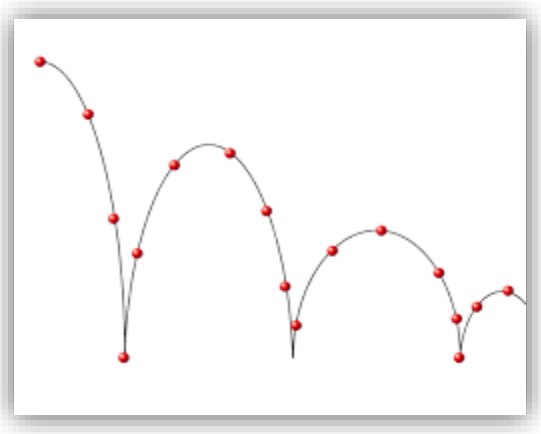
a) Thirty tickets were sold for a concert. Some tickets were sold at \$60 each and the rest at \$100 each. The total amount of money spent on tickets was \$2200. What percentage of the tickets sold were \$60 tickets?

(3 marks)

b) When a metal bar is heated it expands by 0.3%. If the increase in the length of the bar is 1.5 cm, what was the original length of the bar?

(3 marks)

7. A ball is dropped from a height of 300 cm. After each bounce, the ball rises to 80% of its previous height. How high, to the nearest cm, will it rise after the fourth bounce?



(3 marks)

8.

a) Expand and simplify

$$(x - 2)(3x + 2)(x + 5)$$

(3 marks)

b) The n th term of a sequence is $n^2 + 3n$.

Write the first five terms of the sequence.

(2 marks)

9. Solve this simultaneous equation

$$x + 2(y - 6) = 0$$

$$3x + 4y = 30$$

(4 marks)

10. Ana makes a birthday cake with a diameter of 20 cm and a height of 10 cm. She cuts it into 45^0 slices. What is the volume of <u>each slice</u> of cake? *Use 3.14 as the value of π.*

(4 marks)

11. Sean drives from Manchester to Gretna Green. He drives at an average speed of 50 mph for the first 3 hours of his journey. He then has 150 miles to drive to get to Gretna Green. Sean drives these 150 miles at an average speed of 30 mph. Sean says, "My average speed from Manchester to Gretna Green was 40 mph." Is Sean right? You must show how you get your answer.

(4 marks)

12.

a) A cube has a surface area of 384 cm^2. What is its volume?

(3 marks)

b) Find the dimensions of a rectangle which as a perimeter of 48 cm and an area of 119 m^2.

(3 marks)

13.

List the prime factors of 5775

(2 Marks)

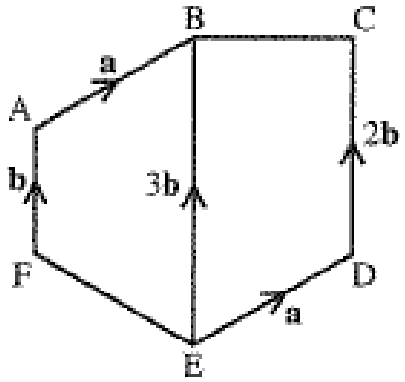
14.

Find

a) $\overrightarrow{AD}$ in terms of vectors *a* and *b.*

b) $\overrightarrow{EA}$ in terms of vectors *a* and *b.*

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



(3 marks)

15.

A man runs to a flower shop and back in 15 minutes. His speed on the way to the shop is 5 meters per second (m/s) and his speed on the way back from the shop was 4 m/s. How far away was the flower shop?

(3 marks)

END OF TEST