THE UNIVERSITY OF THE WEST INDIES
FIVE ISLANDS CAMPUS

Semester II

Examinations of April/May 2022

Course Code:	**ECON0101**
Course Title:	**Preliminary Mathematics for Social Sciences**
Date of Assessment:	**Wednesday, May 11, 2022**
Time:	**1:00pm – 3:00pm**
Duration:	**2 Hours**

INSTRUCTIONS TO CANDIDATES:

This paper has __3__ pages and __8__ questions.

YOU ARE REQUIRED TO ANSWER ___ALL___ QUESTIONS.

THIS ASSESSMENT IS WORTH 60% OF YOUR FINAL GRADE.

ASSIGNMENT DETAILS FROM INSTRUCTORS:

Students are required to answer ALL questions.

PLEASE TURN OVER

STUDENTS ARE REQUIRED TO ANSWER ALL QUESTIONS.

1. a) Given the Universal set U={ 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
Set **A** = { 2, 4, 6, 8, 10 } and Set **B** = { 1 , 2, 3, 5, 6, 9}

i) Draw a Venn diagram to show this information **[2 marks]**

Answer the following questions:
ii) B – A
iii) A' U B'
iv) A'∩B' **[3 marks]**

b) If told that n(U) = 75, n(A) = 50 , n(B) = 25 and n(AUB)' = 15
Find x, the number of elements in both sets. **[3 marks]**

2. a) If A § B = $(A^2 - B^2)/B$, then (-4) § (-5) = ? **[2 marks]**

b) $\sqrt{P + 4Q} = M$ make '**P**' the subject of the equation **[3 marks]**

3. a) Solve $\frac{2(x+3)}{5} = x + 3$ **[3 marks]**

b) Factorize the following completely:
i) $4x^2 - 25$ **[2 marks]**

ii) $3x^2 + 3x - 36$ **[3 marks]**

4. a) In a Stationery store, two pens and four folders cost $22.00.
Five pens and two folders cost $23.00
What is the cost of each item? **[4 marks]**

b) If $T_n = 3n^2 - 2$ represents the n^{th} term of a sequence; where n is a positive integer.
i) Show that the first term is 1 **[2 marks]**

ii) What is the second term **[1 mark]**

iii) What term is 25? **[3 marks]**

PLEASE TURN OVER

5. By constructing graph(s) in the range $-4 \leq x \leq 4$, find the point(s) of intersection between $y = x^2 - 7x - 8$ and $y = -5 - 5x$ **[4 marks]**

Hint: Populate Table:

x	-4	-3	-2	-1	0	1	2	3	4
$Y = x^2 - 7x - 8$									
$Y = -5x - 5$									

6. a) The gradient $m = \frac{y_2 - y_1}{x_2 - x_1}$;where (x_1, y_1) and (x_2, y_2) are points on the line.

i) Find the gradient/slope of the line through the points (1, 7) and (3,13). **[2 marks]**

ii) Find the equation of the line (of form: $= mx + c$) through the points in (i) above. **[2 marks]**

7. a) Given $g(x) = 2x^2 - 8$ and $f(x) = 3x - 2$
Find $g(f(2))$ **[2 marks]**

b) If $h(x) = \frac{2x+3}{x+1}$; Find $h^{-1}(x) =$ **[4 marks]**

8. i) How many ways can the letters of **ALGEBRA** be arranged? **[3 marks]**

ii) How many groups 6 from 8 can be formed? **[2 marks]**

END OF QUESTION PAPER

FORMULAE SHEET

Arithmetic Progression

$T_n = a + (n-1)d$

$S_n = {}^n/_2\,[2a + (n-1)\,d]$

$S_n = {}^n/_2\,[a + L]$

Geometric Progression

$$T_n = ar^{n-1}$$

$$S_n = \frac{a(r^n-1)}{r-1}\ ; if\ r > 1; n \neq 1;\ S_n = \frac{a(1-r^n)}{1-r}\ ; if\ r < 1; n \neq 1$$

Permutation

$${}^nP_r = \frac{n!}{r!(n-r)!}$$

Combination

$${}^nC_r = \frac{n!}{r!(n-r)!}$$

Simple Interest $I = \frac{PTR}{100}$

Roots of quadratic equations : c = 0

if $ax^2 + bx + c = 0$; then

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

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ERRATA SHEET

QUESTION 5 (d): (ORIGINAL)

(d) Find the equation of the perpendicular bisector of the line segment AB in (a) above. **[3]**

QUESTION 5 (d): (CORRECTION)

(d) Find the equation of the perpendicular bisector of the line segment AB in (c) above. **[3]**