This is a Class 1 exam

Lebanon Evangelical School for Boys and Girls

Lebanon Evangelical School
for Boys and Girls Loueizeh - Baabda

Class 12 : Mock 1

20 - 23MAY2024

Do NOT write in this box. Your MARK will be placed here.

Subject :	Maths
Class :	12SE
Teacher :	Nicolas Kordahi
Duration :	1 hour

Your name :		*Time taken to complete exam*
Your Class :		
Exam Room :		
How many sheets, including cover sheet :		

- Do not open this paper until the teacher in charge instructs you to do so.
- The most important thing to remember in taking an exam is NEVER PANIC.
- If you are caught cheating in this exam, you will be awarded zero for ALL exams that are taken on this day.
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I) (8 points)

Consider two urns U and V such that:

U contains five balls: three red and two black.

V contains three balls: one red and two black

One ball is selected randomly from the urn U and two balls are selected randomly and simultaneously from the urn V

1) Verify that the total number of all possible selections is 15.

2) Calculate the number of selections consisting of one red ball from U and two balls with different colors from V.

3) Calculate the number of selections consisting of three balls with the same color.

II) (12 points)

The table below represent the number of CHATGPT subscribers yi (in ten thousand) in terms of the rank of the month xi during the year 2023.

	January	February	March	April	May	June
Rank of the month: xi	1	2	3	4	5	6
Number of subscribers: yi (in thousands)	6	10	16	18	19	20

All the values are rounded to the nearest 10^{-2}.

1) Calculate the percentage increase in the number of subscribers between March and May in the year 2023.

2) Calculate the coordinates $\overline{x}$ and $\overline{y}$ of G, the center of gravity of the statistical data $(x_i\ ,\ y_i)$.

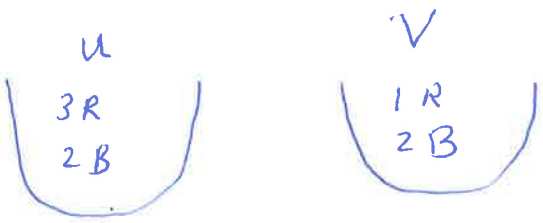
3) Determine the coefficient of correlation r and interpret the obtained result.

4) Write an equation of the regression line (Dy/x) of y in terms of x.

5) Suppose that the model remains valid until December 2023.
   a) In which month of the year 2023 will the number of CHATGPT subscribers exceeds 35 ten thousand for the first time?
   b) The monthly subscription fee for CHATGPT is 20 dollars. The monthly operational cost of CHATGPT is 7 500 000 dollars Will CHATGPT achieve profit during November 2023? Justify.

----------NK.

I-



1) $C_5^1 \cdot C_3^2 = 15$ (2 pts)

2) $C_3^1 \cdot C_1^1 \cdot C_2^1 = 6$ (3 pts)

3) Black : $C_2^1 C_2^2 = 2$ (3 pts)

II - 1) % increase $= \frac{19-16}{16} = 18.75\%$ (2 pts)

2) $\bar{x} = 3.5 \quad \bar{y} = 14.83$ (2 pts)

3) $r = 0.94$
strong +ve correlation (2 pts)

4) $D_{y/x}$: $y = 2.83x + 4.93$ (2 pts)

5) a) $y > 35$
$2.83x + 4.93 > 35$
$x > 10.63 \simeq x = 11$ then November. (2 pts)

b) November : $y = 2.83(11) + 4.93$
$= 36.06$

P_L = Rev − cost
$= (20)(360,600) - 7,500,000 = -288,000$ // No profit (loss) (2 pts)