

**SUBSIDIARY MATHEMATICS**

**……/……./2021**

**8h30 am -11h30am**

**SENIOR FIVE END OF YEAR EXAMINATIONS, 2020/2021**

**SUBJECT: SUBSIDIARY MATHEMATICS**

**COMBINATIONS:**

**PHYSICS-CHEMISTRY-BIOLOGY (PCB)**

**BIOLOGY-CHEMISTRY-GEOGRAPHY (BCG)**

**HISTORY-ECONOMICS-GEOGRAPHY (HEG)**

**HISTORY-ECONOMICS-LITERATURE (HEL)**

**LITERATURE-ECONOMICS-GEOGRAPHY (LEG)**

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|  **/100** **Marks:** |

**DURATION: 3 HOURS**

**INSTRUCTIONS:**

1. Do not open this question paper until you are told to do so.
2. Answer all questions: **100 marks**
3. Use only a **blue** or **black** pen.

**S5 MATH SUBSIDIARY COMPREHENSIVE 2020/2021**

**ANSWER ALL QUESTIONS /100MARKS**

1)Prove that $cos^{2}A$ + $\cos(\left(2A\right))$= 2-3$sin^{2}A$ (10marks)

2) A body falls 16 metres in the first second of its motion, 48 metres in the second, 80 metres in the third, 112 metres in the fourth and so on. How far does it fall during the 11th second of its motion? (10marks)

3)Find the accumulated value of 15,000F at 5% per year for18 years using simple interest. (10marks)

4) In a class, 20% of the students study Economics and History. 80% of the students study Economics .What is the probability of a student studying History given he/she is already studying Economics ? (10marks)

5a) Find the scalar product of vectors  and  (5marks)

 b)Calculate  of the vector  above (5marks)

6)A child building a tower with blocks uses 15 for the bottom row. Each row has 2 fewer blocks than the previous row. Suppose that there are 8 rows in the tower.

a) How many blocks are used for the top row? (3marks)

b) What is the total number of blocks in the tower? (7marks)

Solution

7) a)Find the value of x in  (5marks)

b)Show that the function  is an odd function (5marks)

8) Consider the vector What is the measure of the angle between this vector and z-axis of coordinates system? (10marks)

9)Find the derivative ofthe following functions

 a)  (5marks)

 b)  (5marks)

10) a)Find *b* such that 8,*b*,18 will be in geometric sequence

 (6marks)

 b) Given matrix  , find the trace of matrix  (4marks)