

**MATHEMATICS**

**……/…../2021**

**8h30 am -11h30am**

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

**SUBJECT: MATHEMATICS**

**COMBINATIONS:**

**PHYSICS-CHEMISTRY-MATHEMATICS (PCM)**

**MATHEMATICS-CHEMISTRY-BIOLOGY (MCB)**

**MATHEMATICS- PHYSICS- COMPUTER SCIENCE (MPC)**

**MATHEMATICS-COMPUTER SCIENCE –ECONOMICS (MCE)**

**MATHEMATICS –PHYSICS- GEOGRAPHY (MPG)**

**MATHEMATICS-ECONOMICS-GEOGRAPHY (MEG)**

|  |
| --- |
|  **/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.

S4 CORE MATHEMATICS ,COMPREHENSIVE 2020/2021

**ANSWER ALL QUESTIONS (100MARKS)**

 1 )Evaluate the following:

 a)  (4marks)

 b) Find the value for  in the simplest form (6marks)

 2) Given the propositional function, , determine the values and the truth value for the following:

a) (2marks)

 b)  (2marks)

 c)  (6marks)

 3) Solve simultaneously, by elimination: (10marks)

 

4) Find the equation of the horizontal asymptote to the curve  (6marks)

5) a)Given that A(2, 1), B(4, 4) and C(6, 7), find  in terms of  and  (5marks)

b) Find the image of the point (6, – 3) reflected in the x-axis. ( 5marks)

6) How many different committees of 3 people can be chosen from a group of 12 people? (6marks)

b) A letter is chosen from the letters of the word ‘’AMAZING’’. What is the

probability that the letter chosen is an ‘’A’’? (4marks)

7) A coin is tossed two times. Find the probability of obtaining

(a) A = {two heads} (5marks)

 (b) B = {one head and one tail} (5marks)

8) Rationalize the following (6marks)



9) Calculate

a)  (4marks)

b)  (6marks)

10) Solve the quadratic equation  (6marks)

11) If and 

Find

a)  (3marks)

b)  (3marks)

c)  (3marks)

d)  (3marks)

 **S4 CORE MATHEMATICS COMPREHENSIVE 2020 MARKING SCHEME**

answer 1 a) 4marks



 

 

Answer 1b) **6marks**









answer 2

a) P(7): 7+ 1 > 5 , P(7): 8 > 5 (True) 2marks

b) P(2): 2 + 1 > 5 , P(2): 3 > 5 (False) 2marks

 c)  3marks

  true 3marks

Answer 3 10marks

5x + 3y = 12 ... .... (1)

7x + 2y = 19 ... .... (2)

We multiply (1) by 2 and (2) by –3:

10x + 6y = 24

–21x –6y = –57

Adding the two equations term by term gives:

–11x = –33

x = 3

Substituting x = 3 into (1) gives:

5(3) + 3y = 12

15 + 3y = 12

3y = –3

y = –1

Hence x = 3, y = –1 is the solution to the system of equations.

Answer 4: 6marks



Curve representing  has the horizontal asymptote

**ANSWER 5 5marks**

AB = (2, 3) and BC = (2, 3)

 = (4, 6) =2(2, 3) = 2 = 2

**Answer 5b) 5marks**





Thus, the image of (6, –3) reflected in the x-axis is (6, 3).

 Solution6a 6marks

The number of committees is





Solution6b 4marks

Since two of the seven letters are ‘’A’’, the probability of choosing a letter ‘’A’’

Is 

Answer 7 10marks

The sample space is S = {HH, HT, TH, TT},

A = {HH}, B = {HT, TH},

a)

b) 

Answer 8 **6marks**







answer 9a 4marks







b) 6marks

 









**Answer 10 6marks**

 where



Therefore



So we have 2 roots







Therefore



ANSWER 11

a) 3marks



b)  **3marks**







c)3=28x2 **3marks**

 =3+56

 =59

d)21+28(2) **3marks**

 =21+56

 =77