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GRADE 12

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Hour

**m<uq jk jdr mÍCIKh - 2024**

**First Term Examination - 2024**

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**COMBINED MATHEMATICS**

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* **Answer 05 questions only.**

01. a). Express as a rational number,

**+**

b). Simplify,

c). Solve for ,

02. a). The arrow diagram shows part of mapping

Find,

i). The value of and

ii).

iii).

b). Find the domain and range of the following functions.

i).

ii).

iii).

c). If and  then find,

i). ii). iii). iv).

03. a). State the remainder theorem and prove it. Show that when a polynomial is divided by Where , the remainder is.

If , Where and are real constants. Given that

. Find and

Find the two real linear factors of

b. Express in partial fractions

i). ii).

04. a). If and are non-zero and non-parallel vectors and , then prove that, and .

Let and where and are unit vectors along and axis. If and are parallel vectors, then find the value of .

b). If the position vectors of the points and are and respectively. Find,

i).

ii). the unit vector along

iii). The position vector of the point, which divided in the ratio internally.

c). Define the scalar product of the vectors and

Given that two vectors and , where and . If and are perpendicular then show that

05. Prove the following identities.

a).

b).

c).

d).

06. a). Show that If and

then  and

b). If is a triangle, show that

c). Find the general solution of the following equation .

07.

a). Three coplanar , and act at and the system is in equilibrium. Find the values of and .

b). The resultant of and is . If is reversed and remaining the same, then the resultant is . If and are perpendicular, then show that, .

c). The resultant of two forces and is perpendicular to the force . Find the angle between the two forces and the magnitude of the resultant.