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GRADE 12

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Hours

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**fojk jk jdr mÍCIKh - 2023**

**Second Term Examination - 2023**

ixhqla; .Ks;h

**COMBINED MATHEMATICS**

10

19 / 07 / 2023

* **Answer 06 questions only.**

01. a). Solve the equation

b). Solve the equation

c). Prove that,

d). Resolve into partial fractions,

02. a). If and then show that for all

, .

Find the range of value of , for which

b). If then show that,

If the roots of the equation,

are and

then find the value of

c). State the factor theorem of a polynomial .

Given that and are the factors of the polynomial,

i. Show that and .

ii. Factorize completly.

03. a). If and is an abtuse angle, then find the value of the

b). Prove that , .

c). If then prove that,

. .

d). Find the general solution of the equation,

04. a). Evaluate,

i.

ii.

b). Find the derivative of the function from the first principle,

c). Differentiate with respect to ,

i.

ii.

iii.

05. a). Find the magnitude of two forces such that, when they act at right angle their resultant is of magnitude ***N*** and when the forces act an angle , their resultant is ***N***.

b). State the lamis theorem of three coplanar forces acting at a point.

A weight W is suspended by two perpendicular light inextensible strings of length ***a*** and ***b*** from two points at the same horizontal level show that the tension of one string is . Find also the tension of the other string.

06. a). Let , and be the position vectors of three points , and respectively, with respect to the fixed origin . Where and are non-paralled vectors. Show that , and are collinear. Find the ratio in which divides .

b). is a trapezium of sides and , also and are parallel. Forces of magnitude Newton act along  **, , ,**  and respectively. Find the magnitude and the direction of the resultant.

07. a). A particle is moving in a straight line with a uniform acceleration describes distances and in successive interval of time t. Show that the acceleration of the particle is .

b). A particle is dropped from the top of a cliff of height meters. After it travelles ***m*** meters, then another particle is dropped from the point which is meters below from the top of the cliff. If both particles and meet at the foot of the cliff at the same instant, then show that the height of the cliff is, .