**KIGALI CITY ON 20th, April, 2020**

**MINEDUC/KICUKIRO DISTRICT**

**E.S KANOMBE/EFOTEC**

**CLASS: S4 MPC, MCB, PCM & MEG**

**ASSIGNMENT OF MATHEMATICS /70 Marks**

**1**. Convert 300 grades= degrees = radians **/4Marks**

**2.** Convert decimal degree to degree, minutes, second form and vice-versa

1. 18.2550 **/3Marks**

ii) 40010’25’’ **/3Marks**

**3.** Solve for x :

1. |5 – x| = **/3Marks**
2. −5|2X + 2| − 3 ≥ −3 **/3Marks**

**4**. a) Use De Morgan’s law to write the negation of the following statements, simplifying so that only simple statement are negated: i)( pvq) **/3Marks**

ii) **/3Marks**

b )Present the truth table and prove the following proposition:

[(A(A **/5Marks**

What do you conclude?

**5.** Negate the following statements:

a) p: All prime natural numbers are integers **/2Marks**

b) q:∀x > 0 : x2 > 5 **/3Marks**

**6.** The binary operator T is defined in = E by x **T** y = xy- x - y +2

a) Show that (E, **T**) is an abelian group **/6Marks**

b) Solve for x the equation **T** X= **/2Marks**

**7.** The set S = {a, b, c} with binary operation \* defines a commutative group illustrated by the following Cayley table:

|  |  |  |  |
| --- | --- | --- | --- |
| \* | a | b | c |
| a | a | b | c |
| b | b | c | a |
| c | c | a | b |

1. Is (S,\*) Closure? **/1Mark**
2. Find the identity element. **/1Mark**
3. Find the inverse of each element of S. **/2Marks**
4. Is (S,\*) Commutative?  **/2Marks**
5. Is a\*(b\*c) = (a\*b)\*c? **/2Marksl**

**8.** a) Simplify the expression: sec4a(1 - sin4a) - 2tan2a **/3Marks**

b) Prove the following identity: Sin3= 3sin- 4sin3 **/4Marks**

**9.** If is an angle in quadrant 1 and is an angle in quadrant 2 such that cos= and sin = Evaluate each of the following without the use of calculator.

a) Sin ( ) **/3Marks**

b) Cos ( **/3Marks**

**10.** The sides of a triangle A, B, C are a=6cm, b=8cm and c=5cm. Find the angle B of a triangle and the area of triangle **/4Marks**

**11.** From a point A an observer finds that the angle of elevation of the top of tree is 210. If he walks 10 meters towards the foot of the tree to a point B. He finds that the angle of elevation of the top of the tree is 340.Calculate the height of the tree above the level of observation. **/5Marks**