**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| = $\frac{5}{2}$ **/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)$\rightarrow \~r$ **/3Marks**

 ii) $(\~pΛq)$ **/3Marks**

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

 [(A$\rightarrow B) Λ$(A$\rightarrow C)]\rightarrow [A\rightarrow (AΛC)]$ **/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 $R-\{1\}$= 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 $\frac{1}{2}$ **T** X=$ \frac{3}{4}$ **/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$θ$= 3sin$θ$- 4sin3$θ$**/4Marks**

**9.** If $α$ is an angle in quadrant 1 and $β$ is an angle in quadrant 2 such that cos$ α $= $\frac{3}{5}$ and sin$ β$ =$\frac{3}{5}$ Evaluate each of the following without the use of calculator.

a) Sin ($α- β$ ) **/3Marks**

b) Cos ($α+ β)$ **/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**