Prepared By: Abdurahiman K
Math Teacher, 00919562211151
rahman2ark@gmail.com

Name:

1st ASSESSMENT TEST

Grdade 11 Time Allotted : 1 hour. Max. Marks : 25

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1. Consider $A=\{x: x\,is\,a\,natural\,number, 2\le x\le 6\}$
   $B=\{x: x\,is\,a\,prime\,number, x\le 7\}$, $C=\{x: x^2-5x+6=0\}$
   i) Write A, B, C in the roster form. [3]
   ii) Verify that $(A\cup B)\cup C=A\cup(B\cup C)$. [2]

2. $A=\{1,2,3\}$, $B=\{4,5\}$
   Show whether $A\times B=B\times A$ [1]

3. Show that $(Cos\,x+Cos\,y)^2+(Sin\,x+Sin\,y)^2=4Cos^2\left(\frac{x-y}{2}\right)$. [3]

4. Consider the statement
   $p(n): 1+3+5+...+(2n-1)=n^2$.
   i) Verify $p(1)$ is true. [1]
   ii) Prove $p(n)$ by induction. [2]

5. In a survey of 100 people it was found that 45 people read newspaper A, 50 read newspaper B, 39 read newspaper C, 18 read both A and B, 22 read B & C and 20 read A & C, 8 read all three.
   i) Draw the Venn diagram to represent the above data. [2]
   ii) How many people don't read any of the newspapers? [1]
   iii) How many read exactly one newspaper? [1]
   iv) How many read newspapers A & B but not C [1]

6. Find the domain and range of the function $f(x)=\frac{1-x}{1+x}$ [2]

7. a) the radian measure of 240^0 is (1 radian, $\frac{4\pi}{3}$ radian, $\frac{\pi}{2}$ radian, $\frac{3\pi}{2}$ radian). [1]

   b) if $\sin\theta=\frac{3}{5}$, $\cos\phi=\frac{-12}{13}$, where θ and ϕ both lie in the second quadrant, find the value of $\sin(\theta+\phi)$ [2]

8. Let $p(n)$ be the statement ,
   "$n(n+1)(n+2)\,is\,divisible\,by\,12$".
   i) Is $p(5)$ true? Justify your answer. [1]
   ii) Show that $p(3)$ and $p(4)$ are true [2]

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