**CLASSWORK APPLICATIONS FOR LOOPS**

**Q1.** Write a program that determines all the numbers of multiples of nine between 0 and 1000.

**Q2.** Write a program that determines all the numbers that can be exactly divided both

3 and 4 between 0 and 1000.

**Q3.** Write C++ program to obtain following list:

 1-2-4-8-16-32-...........-131072

**Q4.** Implement the flow chart (below) in a C++ program. All variables should be type “double”.

i = 0 ; s=0

start

input n

 i < = n

s = s+i

 output s

T

F

end

i++

**Q5.** Write a computer program to show that the following series sum is equal to one.



**Hints:** Use double for all your variables. You will need to calculate many terms; check your program first with 100 terms then 10000, and then 1000000 terms; you should find that the accuracy increases as the number of terms increase.

**Q6.** Write a program that calculates the end deflection of the beam while the load changes from zero to 10kN with an increment of 0.5 kN.

 ****

where E = 210 109 Pa

 I = 8.333 10-5 m4

 P is vertical end load

 L is length of beam

P

L=1 m

# Q7. A particle moves along the x-axis with an initial velocity v=50 m/s. The x position of this particle can be defined using following equations.

#

#

Write a program to find the position x of particle in steps of 0.1 seconds for the interval

0 ≤ t ≤ 9 seconds.

**Q8.** Write a program to calculate the following function for x between -5 and 5 with 0.1 increments.

$$f\left(x\right)=\frac{\sqrt{16-x^{2}}}{x+3}$$

**Q9.** Write a program to obtain the following output using nested loops.

\*

\*\*

\*\*\*

\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*\*

\*\*\*\*\*\*\*

\*\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*

\*\*\*

\*\*

\*

**Q10.** Write a program that determines the deflection of simply supported beam at points 0, 0.1, 0.2, 0.3 ... 2 m. The program also displays the maximum deflection.

δmax

y

x

w

L

$y=\frac{wx}{24EI}(l^{3}-2lx^{2}+x^{3})$

Where $w=200 N/m$

L=2 m

E=200 GPa

I=1.2\* 10-6 m4.

**Q11.** Write a program that determines the horizontal and vertical position of a particle when the time changes between 0 and 20 seconds with an increment of 0.5. It is thrown with an initial velocity of 50 m/s and with an initial angle of 60° with horizontal axis. The program also displays the maximum height that can be reached by object.

**Hint:**

The horizontal position $x=V\_{0} Cosθ t$

The vertical position $y=V\_{0} Sinθ t-\frac{1}{2}g t^{2}$

$$θ=60°$$

$$V\_{0}=50m/s$$

x

y

**Q12.** Write a program that calculates the square root of a given number. Program repeats the calculation until the user want to stop. Also the program should not attemp to calculate the square roots of negative numbers.