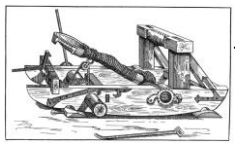
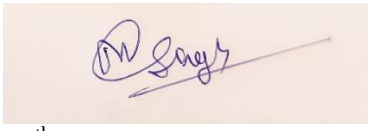


NAME: Meharamt Singh Roll No: 102003241 Group: 1CO10

This submission is original work and no part is plagiarized (signed)



24th August, 2021

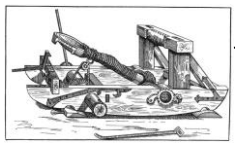
THAPAR INSTITUTE
OF ENGINEERING & TECHNOLOGY
(Deemed to be University)

MECHANICAL ENGINEERING DEPARTMENT
Thapar Institute of Engineering and Technology, Patiala

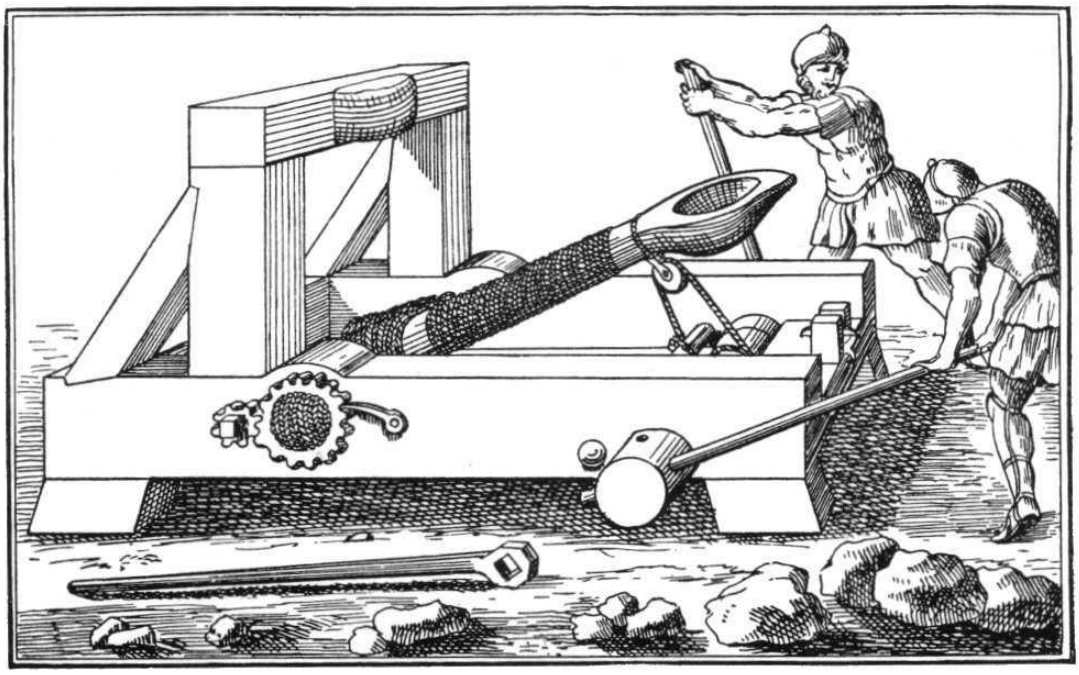
ASSIGNMENT - 1
DYNAMICS FOR THE MANGONEL-NO DRAG

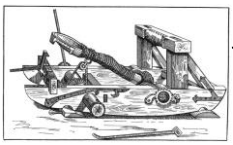
UTA016 Engineering Design Project-I

(Reference: TCD course 1E13)



NAME: Meharamt Singh Roll No: 102003241 Group: 1CO10





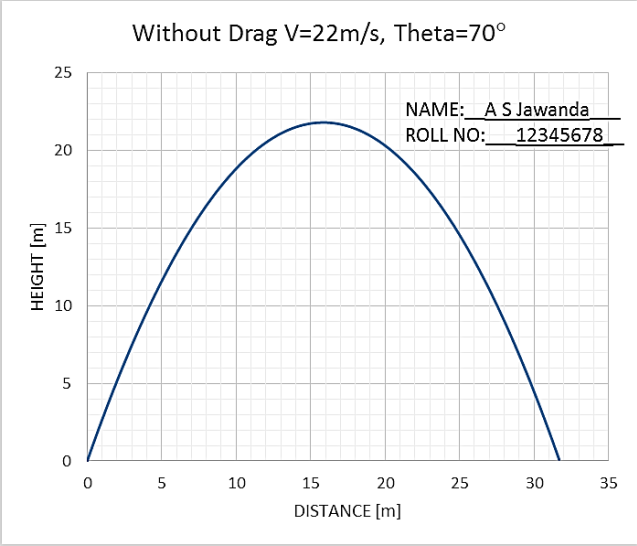
NAME: Meharamt Singh Roll No: 102003241 Group: 1CO10

ASSIGNMENT - 1
DYNAMICS FOR THE MANGONEL - NO DRAG

The following assignment has been based on the lecture on projectile dynamics for the Mangonel -with **No drag**. Complete the following **individually, copying will be dealt with severely**.

Notes:

1. Ensure on all graphs the curve is visible and sufficient resolution is provided so that the height and distance is determinable. The following chart is an example for 25 degrees at 15 m/s.



Note:
Compulsory to Add Text box of Name and Roll No to every graph as shown.

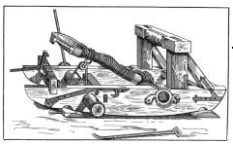
2. **The excel graph and results for: One Launch angle in degrees, velocity in m/s have to be shown for evaluation on the same day.** While the remaining part of assignment is to be submitted within is to be submitted before next Tutorial class (if it is a holiday, then as instructed).
3. Do not leave this assignment until the last minute to find you have some IT issue.

Enjoy the assignment and try to think around the subject as much as possible and take from it any tips that you might use with your own Mangonel design.

Marking Scheme:

Tutorial 1 Total = 5 Marks
Evaluation at end of Tutorial class = 2.5
Home evaluation = 2.5

TUTORIAL CLASS EVALUATION



NAME: Meharamt Singh Roll No: 102003241 Group: 1CO10

Only Q1a below evaluated at the end of tutorial class on computer.

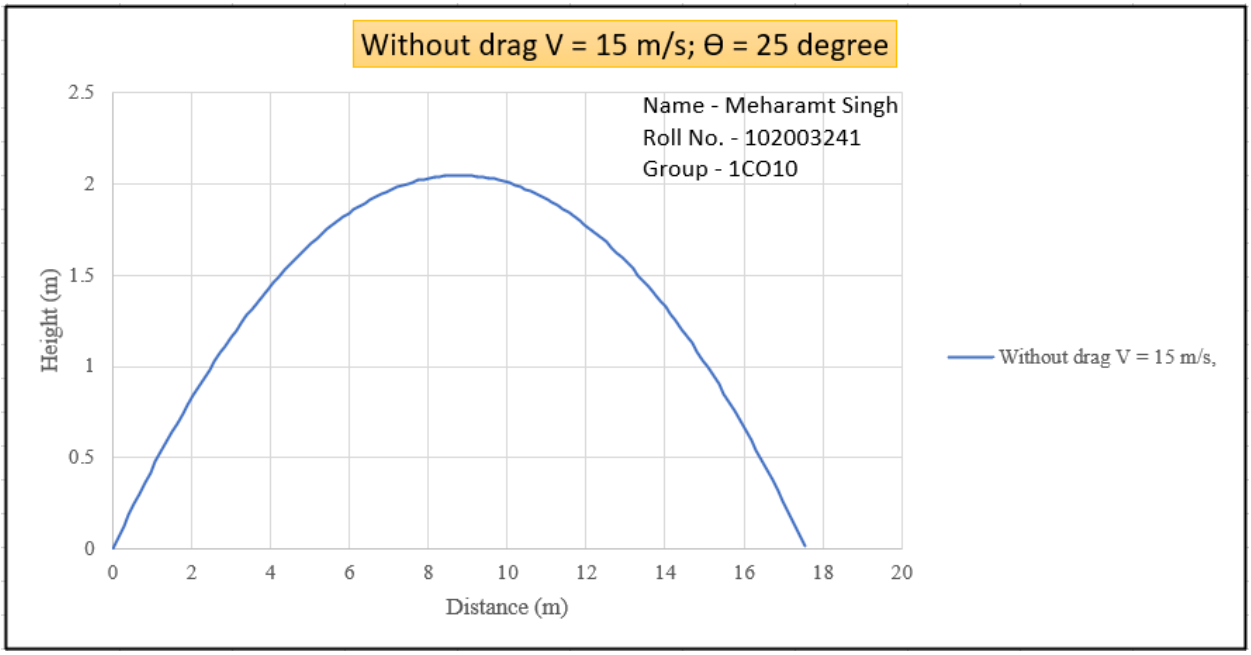
Point five Marks each for: [2.5 Marks]

1. Excel sheet formulation,
2. Layout,
3. Graph series,
4. Graph clarity and
5. Graph format, as given in note.

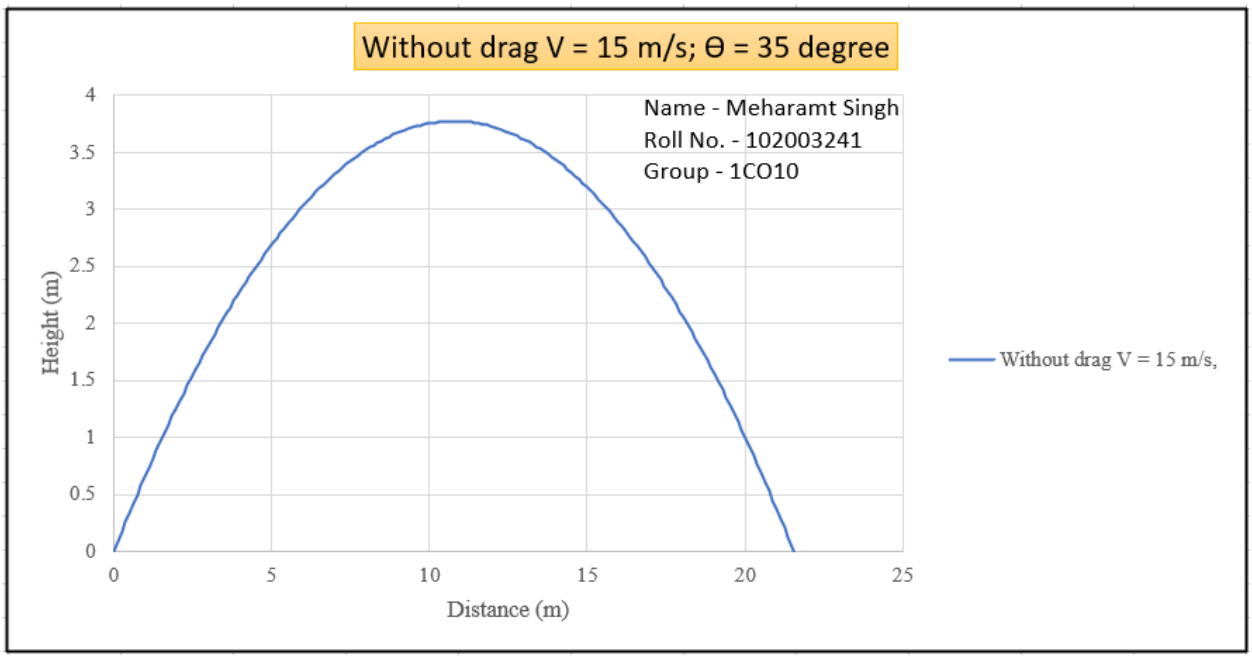
NOTE: ***Compulsory*** *to Add Text box of Name and Roll No to every graph as shown.*

Q1. Using the Excel spread sheet that you have developed to model the dynamics of a "missile" cast by the Mangonel, copy and paste graphs for the following into this document

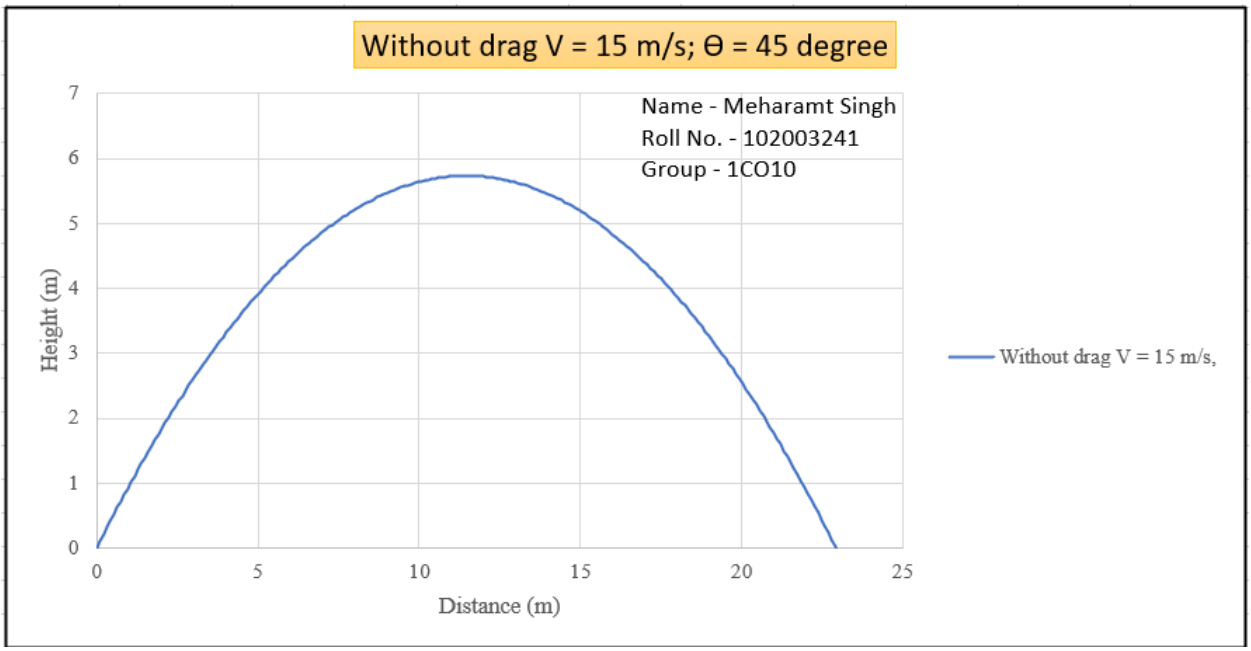
a. No drag: Launch angle 25 degrees, velocity 15m/s



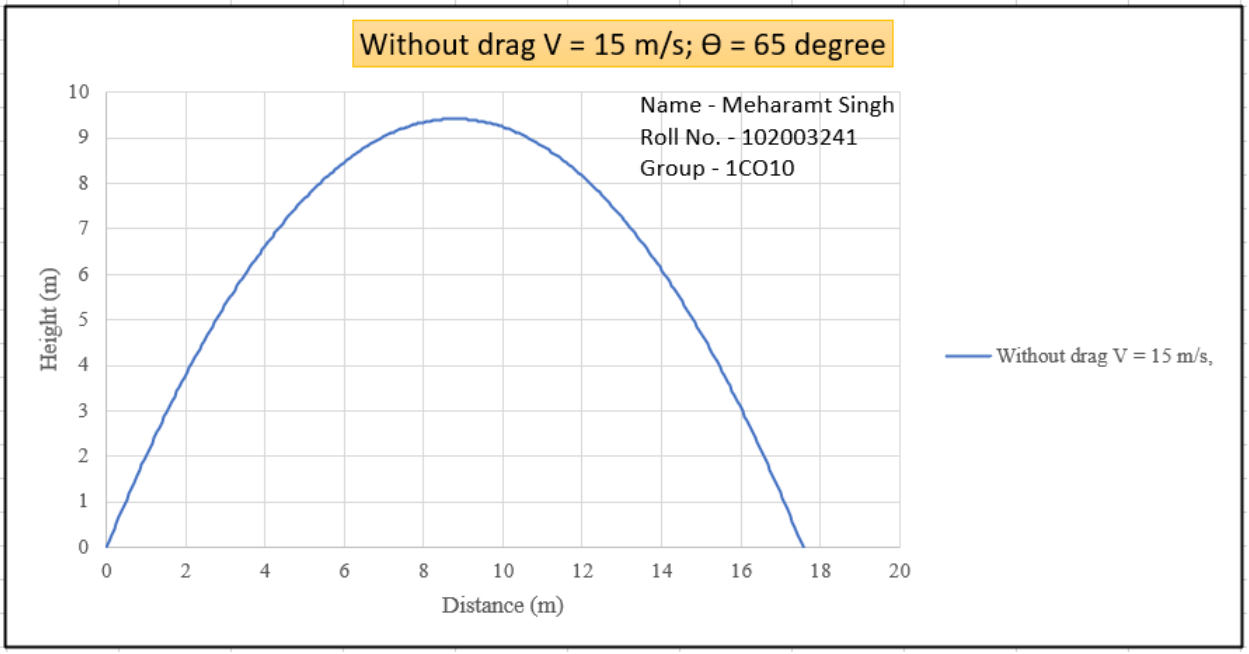
b. No drag: Launch angle 35 degrees, velocity 15m/s



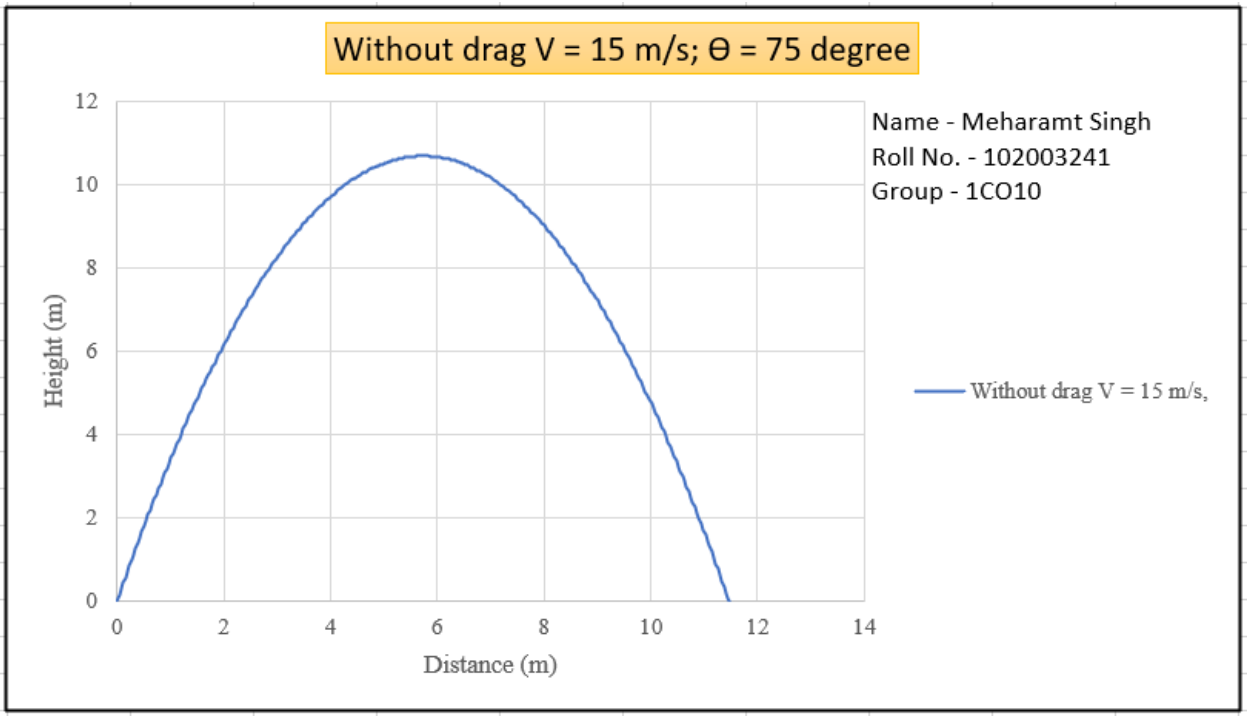
c. No drag: Launch angle 45 degrees, velocity 15m/s

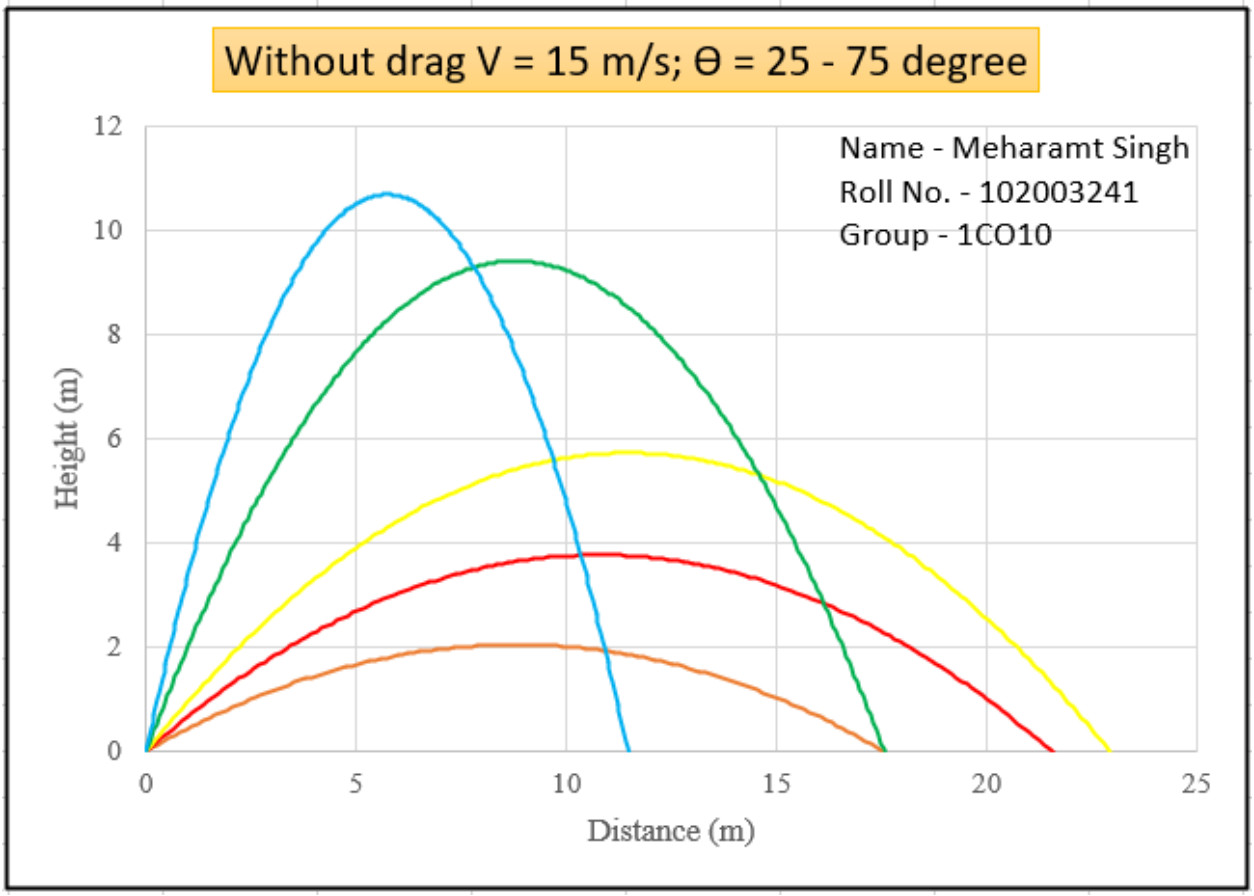


d. No drag: Launch angle 65 degrees, velocity 15m/s

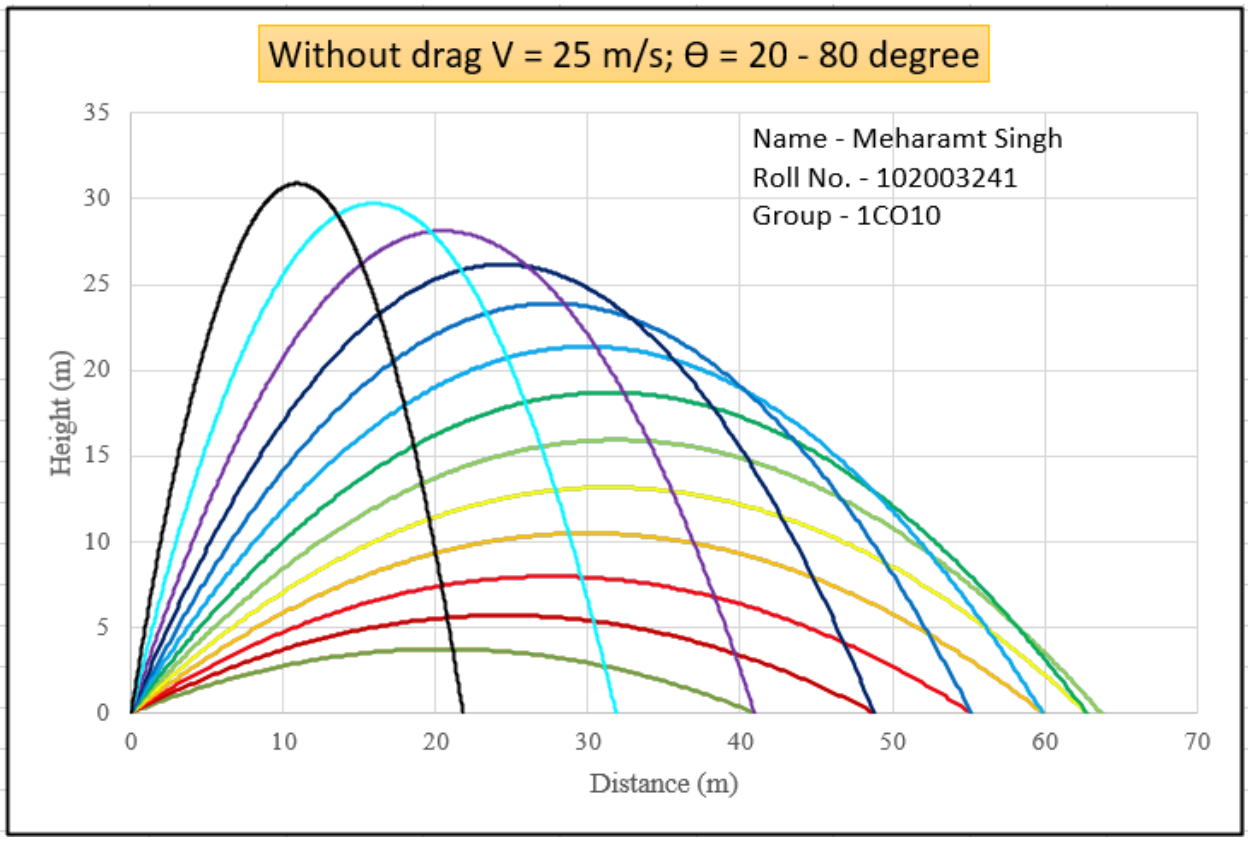


e. No drag: Launch angle 75 degrees, velocity 15m/s

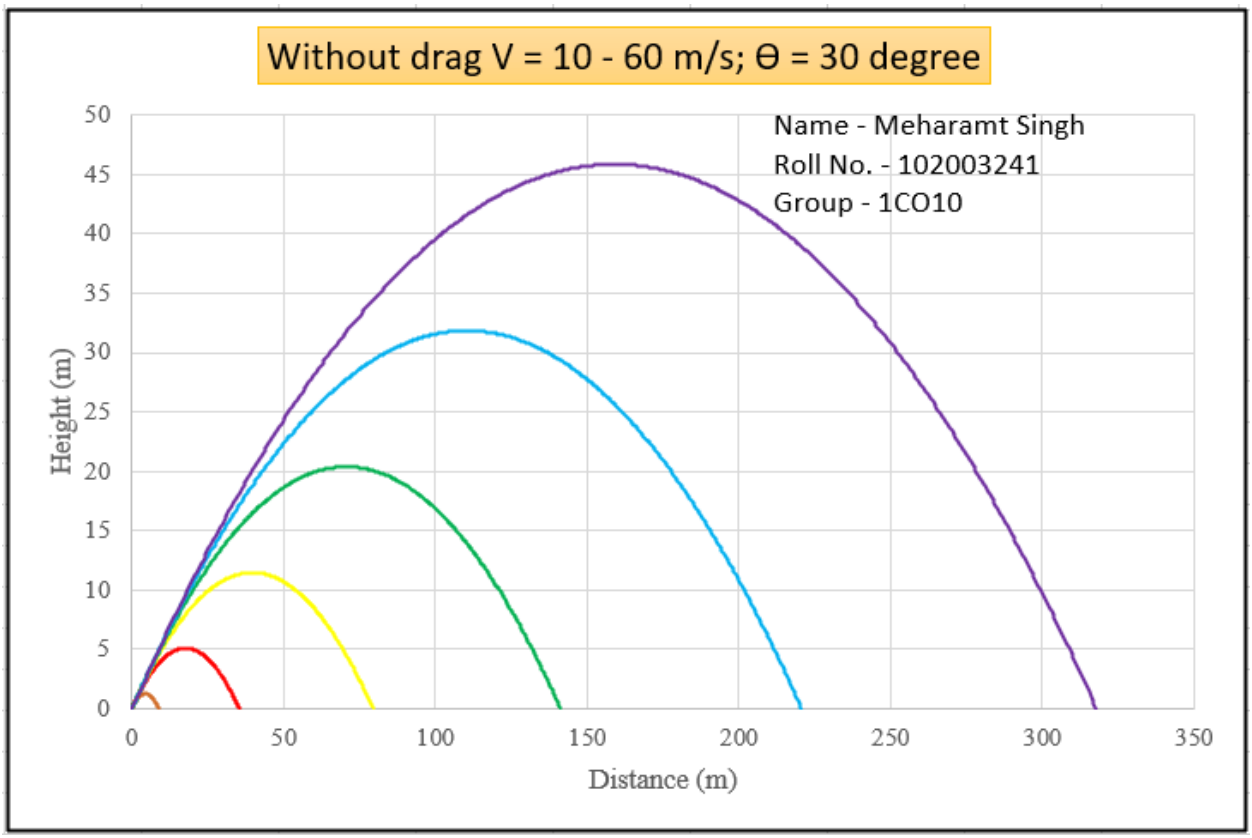


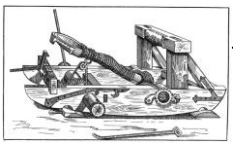

Without drag V = 15 m/s; Θ = 25 - 75 degree
Name - Meharamt Singh
Roll No. - 102003241
Group - 1CO10
Height (m)
Distance (m)
0
2
4
6
8
10
12
0
5
10
15
20
25

Q2. Plot a combined graph for No drag: Launch velocity 25m/s for angle varying from 20 degrees to 80 degrees in step of 5 degrees.



Q3. Plot a combined graph for No drag: Angle 30 degrees and launch velocity varying from 10m/s to 60 m/s in step of 10 m/s.





NAME: Meharamt Singh Roll No: 102003241 Group: 1CO10

Q4. For the combined graphs in Q1, Q2 and Q3 comment on the effect of angle of launch and velocity on the horizontal distance travelled.
(HANDWRITTEN ONLY)

Ans 4 (i) From θ = 0° to 45°, horizontal distance (Range) increases.
From θ = 45° to 90°, horizontal distance (Range) decreases
Maximum Range is observed at θ = 45°

(ii) Horizontal distance (Range) increases with the increase in launch velocity for the same launch angle. as seen in graph of ques-3.

END