Simulator Requirement Specification

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| Department Name | Mechanical |
| Class | S.Y. B.Tech |
| Semester | Ist |
| Subject Name | Fluid Mechanics. |
| Experiment No. | 02 |
| Experiment Name | Calibration of Orifice-Meter |

Version History

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| --- | --- | --- | --- | --- |
| Sr. No. | Version Number | Created By | Approved By | Date |
| 1 | v1.0 | Akash Salunkhe | Prof. Mr. Rohit Ghulanavar | 02/11/2020 |
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Detailed Requirement Specification

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| **Req. ID** | **Visual Entity Required** | **Requirement Description** | **Comments** |
| REQ1 | An empty box in the front of the text ‘Velocity (V):’ | It will show the five choices of velocities. User has to select the velocity from these 5 choices. |  |
| REQ2 | Button ‘CLEAR’ | It will clear the choice of velocity that user has made. |  |
| REQ3 | An empty box in the front of the text ‘Inlet diameter of pipe (d1) : ’ | It will show the value of inlet diameter of the pipe. | It will constant throughout the experiment.  d1 = 2.80 cm |
| REQ4 | An empty box in the front of the text ‘Inlet area of pipe (a1) : ’ | It will the show the value of inlet area of the pipe. | It will be constant throughout the experiment.  a1 = 6.1575 cm2 |
| REQ5 | An empty box in the front of the text ‘Inlet diameter of orifice (d0) : ’ | It will show the value of inlet diameter of the orifice. | It will constant throughout the experiment.  d0 = 1.40 cm |
| REQ6 | An empty box in the front of the text ‘Inlet area of orifice (a0) : ’ | It will show the value of the inlet area of the orifice. | It will be constant throughout the experiment.  a0 = 1.5393 cm2 |
| REQ7 | An empty box in front of the text ‘Differential Manometer Reading (x): ’ | It will show the value of the manometer reading which is nothing but pressure difference. | It will vary according to the velocity that user has chosen.  Its unit will be ‘cm of Hg’  For these values refer the reference images attached to mail. |
| REQ8 | An empty box in front of the text ‘Pressure Difference in terms of the cm of water :  hhg×() =’ | It will show the value of the pressure difference in terms of cm of water. | Formula is given below. |
| REQ9 | An empty box in front of the text  ‘Actual Discharge (Qact) = a1 × V = ’ | User should enter the value of the Actual Discharge by calculating himself/herself. | V is velocity that user has chosen previously and a1 is inlet pipe diameter. |
| REQ10 | Button ‘CHECK’ | User will click on this button after entering the calculated value inside the above box.  If entered value is correct then ‘CORRECT’ should appear for short period of time. |  |
| REQ11 | An empty box in front of the text  ‘Theoretical Discharge (Qth)=  (a1×a0×(2×g×h)1/2) / (a12 – a02)1/2 =’ | User should enter the value of the Theoretical Discharge by calculating himself/herself. | ‘h’ must in cm of water.  Please give comment to user that ‘h is in cm of water’. |
| REQ12 | Button ‘CHECK’ | User will click on this button after entering the calculated value inside the above box.  If entered value is correct then ‘CORRECT’ should appear for short period of time. |  |
| REQ13 | An empty box in front of the text  ‘Coefficient of Discharge (cd) =  = ’ | User should enter the value of the Coefficient of Discharge by calculating himself/herself. |  |
| REQ14 | Button ‘CHECK’ | User will click on this button after entering the calculated value inside the above box.  If entered value is correct then ‘CORRECT’ should appear for short period of time. |  |
| REQ15 | Button ‘RESET’ | It will reset the whole simulator screen. | If user wants to perform the experiment again he/she will press this button. |

Formulae :

1. Pressure difference in cm of water = hhg ×() cm of Water
2. Theoretical Discharge = (a1×a0×(2×g×h)1/2) / (a12 – a02)1/2
3. Actual Discharge = a1 × V
4. Coefficient of Discharge (cd) =