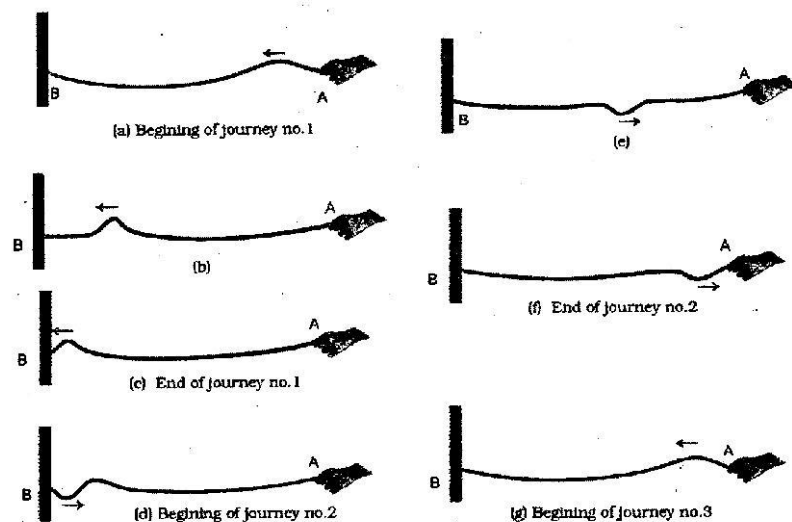# Class IX

EXPERIMENT No: 5

AIM: To determine the velocity of a pulse propagated through a streched string/slinky.

Transverse pulse

Material required : A 10m long lightly knitted cotton string or rope of about 0.5 cm diameter, a stop-watch or stop clock, and a meter scale.

Procedure :

1. Find the least count of the stop-watch.

2. Fix one end of the tightly knit cotton string or rope by tying its one end to door handle or to a window grill.

3. Stretch a known length of the string, while holding the other end firmly with hands.

4. Give a small transverse horizontal jerk to the sting at one end to create a pulse, and simultaneously switch on the stop watch.

5. Measure the time taken by the pulse to move back and forth n number of times along the entire length of the string before it dies out.

6. Repeat the experiment with different lengths of the same string.

7. Note the time taken by pulse for making n journeys through different length of the string.
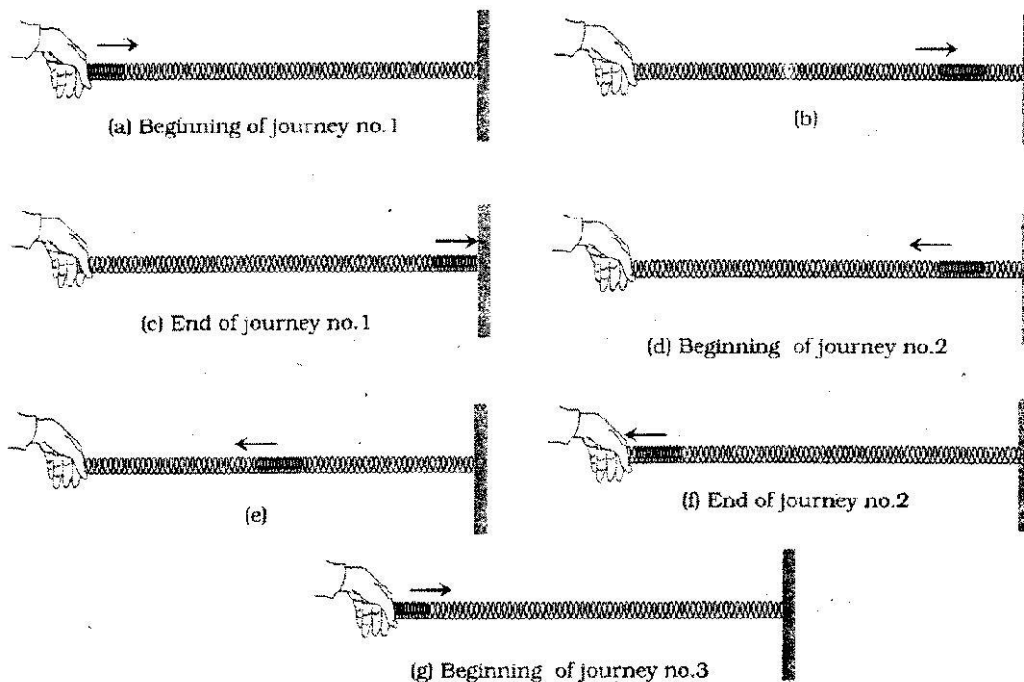

(a) Begining of journey no. 1
(e)
(b)
(c) End of journey no.1
(f) End of journey no.2
(d) Begining of journey no.2
(g) Begining of journey no.3

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Longitudinal Pulse

Material required : A long metal slinky, a meter scale, a stop watch, a thread.

Procedure :

1.   Find the least count of the stop watch.

2.   Fix one end of metal slinky to a rigid support such as a door handle or a window grill.

3.   Hold the other end of the slinky and stretch it until its coils are nearly 1 cm apart. Measure the length of the stretched slinky using thread l meter scale.

4.   Make sure that the slinky is not vibrating.

5.   Now gather few slinky coils and quickly release the gathered ginky coils and simultaneously switch on the stop watch.

6.   Measure the time taken by the longitudinal pulse to more back and forth number of times before it dies out.

7.   Repeat the experiment with different lengths of the same slinky.

(a) Beginning of journey no. 1

(b)

(c) End of journey no.1

(d) Beginning of journey no.2

(e)

(f) End of journey no.2

(g) Beginning of journey no.3

Observation :

Least count of the stop watch = ＿＿＿＿＿＿ S

Type of	Length of the stretched slinky sting between two ends l (m)	Time taken by the pulse making n journeys, t (s)	Time taken by the pulse in making 1 journey, T = t/n (s)	Velocity of pulse (ms-1)
Transverse	l_1			$v_1 =$
	l_2			$v_2 =$
	l_3			$v_3 =$
Longitudinal	l_1			$v_1 =$
	l_3			$v_2 =$
	l_3			

Precautions :

1. The slinky string should not have any knot or any kink at any pint along its length.

2. At the time of creation of the pulse the counting must start form zero and the stop watch should be started at the same time.

3. The amplitude of the pulse should be kept large so that it can get reflected sufficient number of time.

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