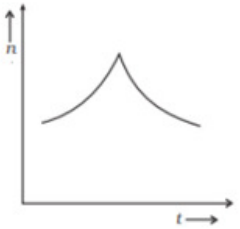
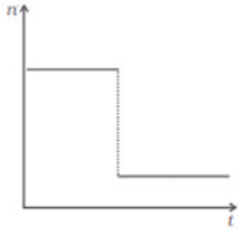
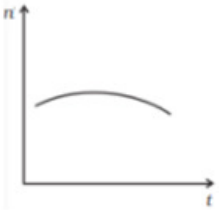
QUES 01:-

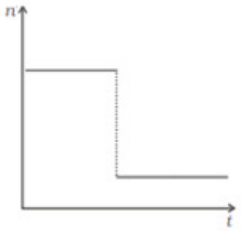
A train whistling at constant frequency is moving towards a station at a constant speed V. The train goes past a stationary observer on the station. The frequency n′ of the sound as heard by the observer is plotted as a function of time t (Figure). Identify the expected curve.

1) 

2) 

3) 

4) 

Sol. 2) 

When observer is at rest and source of sound is moving towards observer then observed frequency n_0

$n' = \left(\frac{v}{v - v_s}\right) n_0$

Where n_0 = original frequency of source of sound

v = speed of sound in medium

$\therefore n' > n_0$ v_2 = speed of source

When source is moving away from observer

$n' = \frac{v}{(v + v_s)} n_0, n' < n_0$

Hence, the frequencies in both cases are same and n' > n".