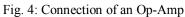
Bangladesh University of Engineering and Technology (BUET) Department of Computer Science and Engineering (CSE)

CSE 210 Digital Electronics and Pulse Techniques Sessional

Experiment# 7: Study of Schmitt Triggers

CKT diagrams: R_2 R_{2} R_1 R_1 $V_{\rm in}$ \circ $V_{\rm out}$ $V_{\rm out}$ Fig. 1: Non-inverting Schmitt Trigger Fig. 2: Inverting Schmitt Trigger R_2 offset null 1 8 nłc R_1 inv. input 2 7 ٧. R_3 Vin • output inv. input 3-Vout 5 offset null \mathbb{Z}_1 R_4 \mathbb{Z}_2

Fig. 3: Practically used Schmitt Trigger



Apparatus:

- 1. Op-Amp 741 (1pc; Set V+ = +5V and V- = -5V following Fig. 4)
- 2. Resistor (4 pcs; $R_1 = 1K\Omega$, $R_2 = 2K\Omega$, $R_3 = 10K\Omega$, and $R_4 = 10K\Omega$)
- 3. Zener diodes (2 pcs; $Z_1 = 2.7V$ and $Z_2 = 3.3V$)

Procedure:

For all figures –

- 1. Slowly increase the input from 0V and observe the output in the oscilloscope. Record the value of V_{in} for which the output changes.
- 2. Slowly decrease the input to 0V and observe the output in the oscilloscope. Record the value of V_{in} for which the output changes.
- 3. Apply sine wave (10V p-p 50 Hz) as input and observe the output in the oscilloscope.

Question:

- Why the designs in Fig. 1 and Fig. 2 are not generally used in real circuits?
 Why R₃ and R₄ are used in Fig. 3?
- 3. What is the purpose of using Z_1 and Z_2 in Fig. 3?

Report:

Report should cover the following points:

- 1. Objective
- 2. Circuit diagram and input-output wave shapes
- 3. Answer to the questions
- 4. Discussion of the findings
- 5. Applications of your study