Bangladesh University

Department of CSE

Final Examination, Summer Semester 2026

Course Code: CSE-3205

Course Title: Digital Electronics and Pulse Techniques

Course Teacher: Anisa Walida

Batch: 69 (Evening)

Time: 2.00 hours **Total Marks: 4×10=40**

Answer any 4 questions from below.

No.				Marks
	Parameter	**Family A**	**Family B**	
	V_{OH}	5.0 V	3.2 V	
	V_{IH}	3.6 V	2.1 V	
	V_{IL}	1.4 V	0.9 V	
	V_{OL}	0.2 V	0.3 V	

Table 1

1. (a). What is meant by noise attenuation in a digital logic gate? 2
   (b). Explain the VTC characteristics of an actual inverter with a suitable diagram. 4
   (c). From Table 1 4
   (a) Calculate *NMH* and *NML* for both families.
   (b) Determine which logic family has better **noise immunity** and justify your answer.

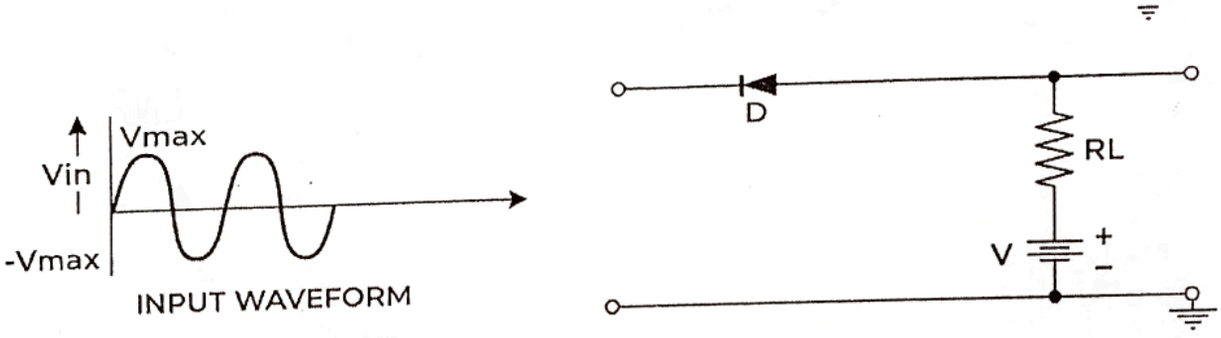
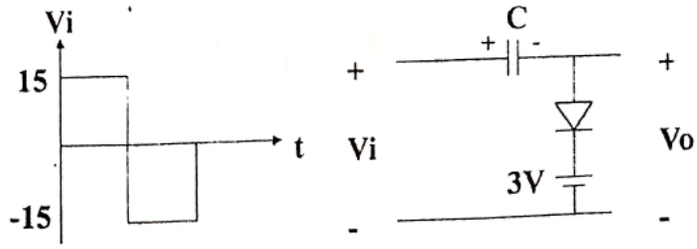


Figure 1

2. (a). Classify diode clippers based on their configuration. 2
   (b). Draw the circuit diagram of a negative shunt clipper. 3
   (c). Determine the output waveform of the circuit shown in Figure 1 and explain its operation in detail. 5



The diode is a non-ideal with $V\gamma = 0.7V$

Figure 2

P.T.O.

3. (a). Explain the function of the capacitor in a clamper circuit. 4
(b). Determine the output waveform of the circuit shown in Figure 2 and explain its operation in detail. 6

4. (a). What is a BCD ripple counter? 2
(b). Differentiate between asynchronous and synchronous counter. 3
(c). Draw the circuit diagram of a 2-bit binary up counter and illustrate its operation using a timing diagram. 5

5. (a). Explain the effect of propagation delay in an asynchronous counter and why it does not produce the same ripple effect in a synchronous counter. 4
(b). Draw the circuit diagram of a 2-bit synchronous up counter and explain each step involved in the derivation of the circuit. 6