Sl. No #

American International University- Bangladesh (AIUB)
Faculty of Engineering

Course Name:	Electronic Devices	**Course Code:**	EEE 2103
Semester:	Summer 2022-23	**Term:**	Mid
Total Marks:	20	**Submission Date:**	July 06, 2023 (11 to 1 PM)
Faculty Name:	Ms. Sadia Yasmin	**Assignment:**	OBE

Course Outcome Mapping with Questions

Item	COs	POIs	K	P	A	Marks	Obtained Marks
Q1	CO1	P.b.1.C4	K1	-	-	20	

Student Information:

Student Name:	**Student ID:**
Section:	**Department:**

Marking Rubrics (to be filled by Faculty):

Problems	Excellent [14]	Proficient [13-11]	Good [12-9]	Acceptable [8-7]	Needs Improvement [6-3]	Unacceptable [2-1]	No Response [0]	Secured Marks
Q1 (i)	Detailed unique response explaining the systematic diode theories properly and answer is correct with all works clearly. shown.	Response with no apparent errors and the answer is correct, but systematic diode theories explanation is not adequate.	Response shows understanding of the problem, but the systematic diode theories applications/explanations may not be correct.	Partial problem is solved; response indicates part of the problem was not understood clearly and partial application of systematic diode theories.	Partial problem solved with minor error that needs to be fixed.	Unable to clarify the understanding of the problem and systematic diode theories.	No Response	
Problems	Excellent [6]	Proficient [5]	Good [4]	Acceptable [3]	Needs Improvement [2]	Unacceptable [1]	No Response [0]	Secured Marks
Q1 (ii)	Detailed unique response explaining the concept properly and answer is correct with all works clearly shown.	Response with no apparent errors and the answer is correct, but explanation is not adequate/unique.	Response shows understanding of the problem, but the final answer may not be correct	Partial problem is solved; response indicates part of the problem was not understood clearly.	Partial problem solved with no/vague conclusion regarding optimum choice of component	Unable to clarify the understanding of the problem and method of the problem solving was not correct.	No Response	
Comments							**Total marks(20)**	

Instructions:

1. ***Separate cover page is provided for this assignment. Different cover page or without cover page, assignment submission will not be acceptable.***
2. ***No late submission is allowed.***
3. ***Fill up the table and then start writing your answer.***
4. ***Note: Copied/identical submissions will be graded as 0 for all parties concerned.***

Instructions Related to Use Variables:

Note that this problem uses the variables a, b, c, d, and e, which are the digits of middle of your student ID (22-abcde-1).
If any of the value is zero, assume it '5'.

a	b	c	d	e

Zero level detector:

In any of your projects in Fig-1, you are required to detect zero level using an AND gate. Your task is to create a square wave pulse using diode. Diode will only be used to construct AND gate, and AC source is only available. Now, you need to observe the AND operations and your available AC supply is given, (ab+220) V (rms) at 50 Hz. You are asked to design a dc source of having the output, Vo of [(c+d+e) mV x 10]. This Vo could be considered as the supply/Reference for the AND operations (Diode Logic only).

Now, for 2 input AND operation, Input-1 pulse will be generated from another AC power supply with 35sinωt and input-2 will be kept grounded. Output can be observed through the 'Red' LED with an angular frequency, ω = ((b+c+d)*(a+e)) radians to understand the AND gate operations.

Design parameters constraints: Consider the peak voltage of the AC supply is smaller than the PIV of the diodes. All the diodes are considered Si (~0.7V) and Zener diode, Capacitor, Resistors, LED, etc. will be considered to meet your assignment outcome to meet the objectives.

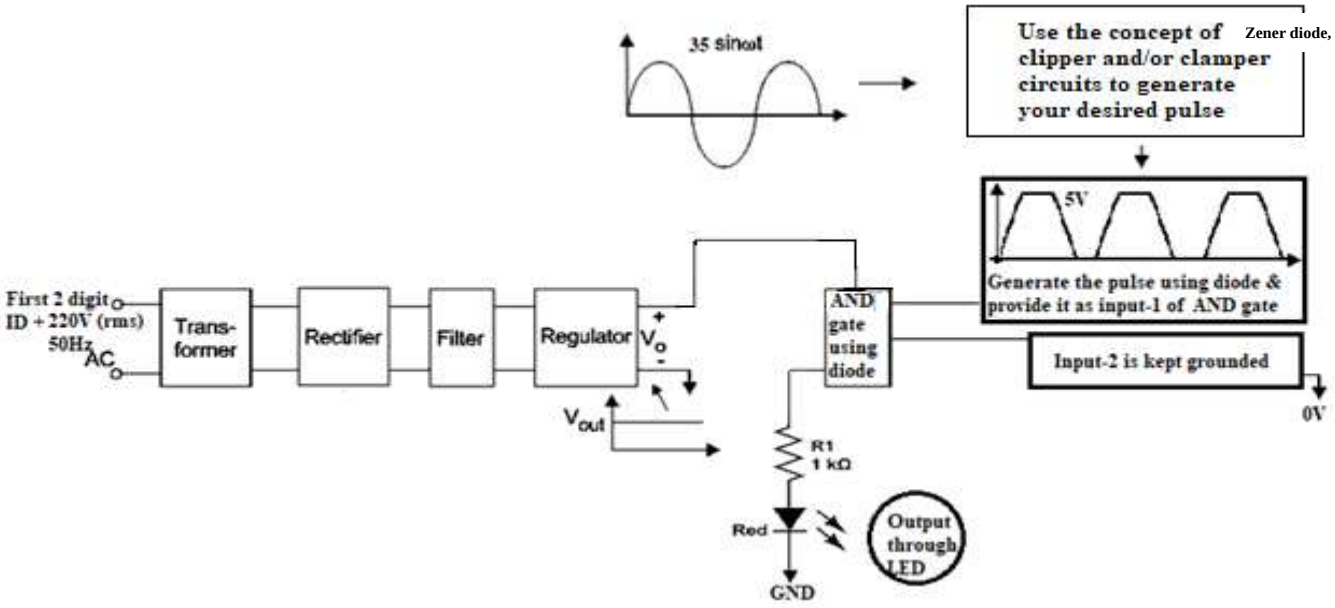

Figure 1: Block diagram for the signal rectification and AND gate operation

Based on this criterion, prepare the following:

1. **Sketch** all the step-by-step procedure and **construct** the connection in a single circuit and **analyze** each part of the circuits. ***[Marks: 14]***

2. **Show** the calculation so that 'Red' LED will indicate the output pulse as per the AND operation. ***[Marks: 06]***