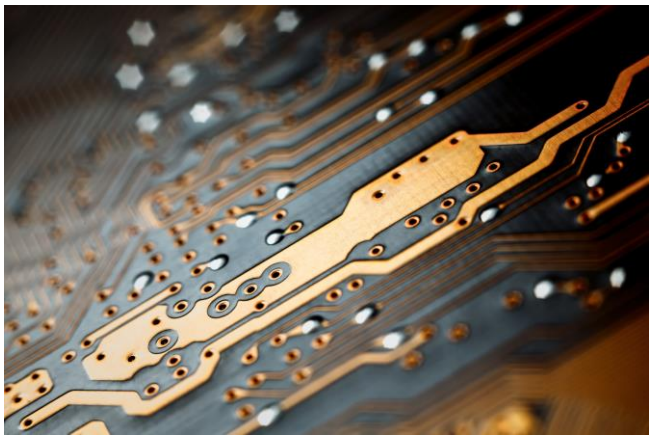

FINAL ROUND

PCB Design Contest 2023

"In the world of PCB design, innovation flows through the traces and creativity sparks between the components." - Unknown

IEEE Robotics and Automation Society
BUET Student Branch Chapter

Design Guidelines:

- Suppose you are the main EEE engineer at a consumer electronics start-up. You get to face a wide range of design problems every day. As you are at a start-up, no one is there to guide you. So, most of the time, you need to google your way out.
  The CEO of your start-up just gave you these two design tasks and told you to complete it within 24 hours.
- Submit all the things similar to what you submitted for round 1.
- Attempt as much as you can. If you cannot understand exactly which component is used in the schematics, use similar component as you think fits best.
- You must complete everything on your own. Contacting the organizers for anything related to the contest problems will result in negative marking.

Judging Criteria

Some of the criteria are as follows but not limited to:

- Compact, elegant, and efficient design
- Minimum number of vias

Problem-1 (1000 points)

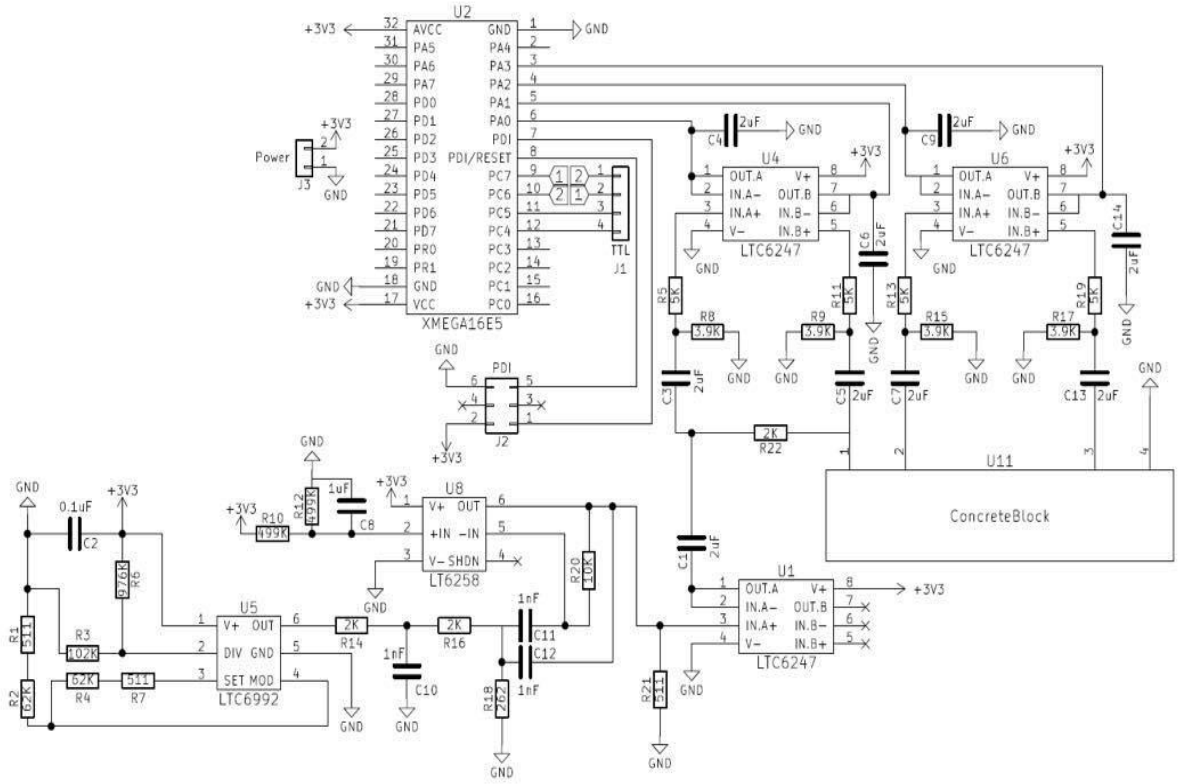

Figure 1: Problem 1 schematics

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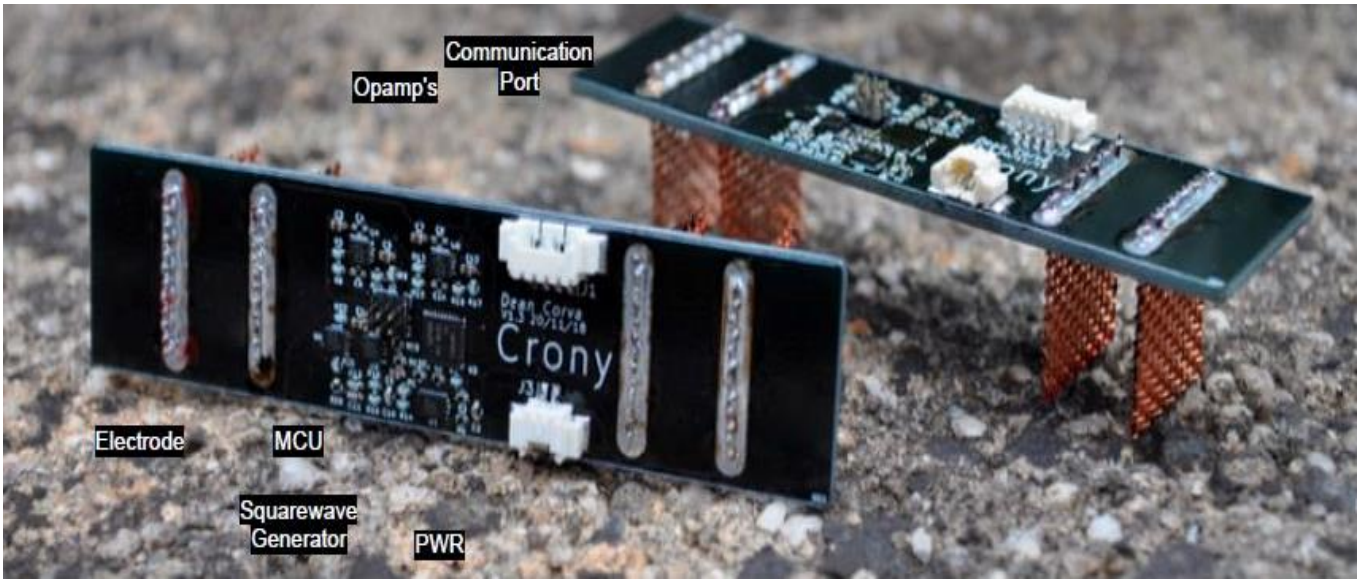

Figure 2: Problem 1 device in real life

Here, you can see the scheamtics of a specific circuit board names as Miniature Resistance Measurement Device for structural health monitoring of reinforced concrete infrastructure. Design the

PCB layout for this specific device. You may notice the 4 metallic legs and they will be injected into the concrete block for its operation.

Problem-2 (1100 Points)

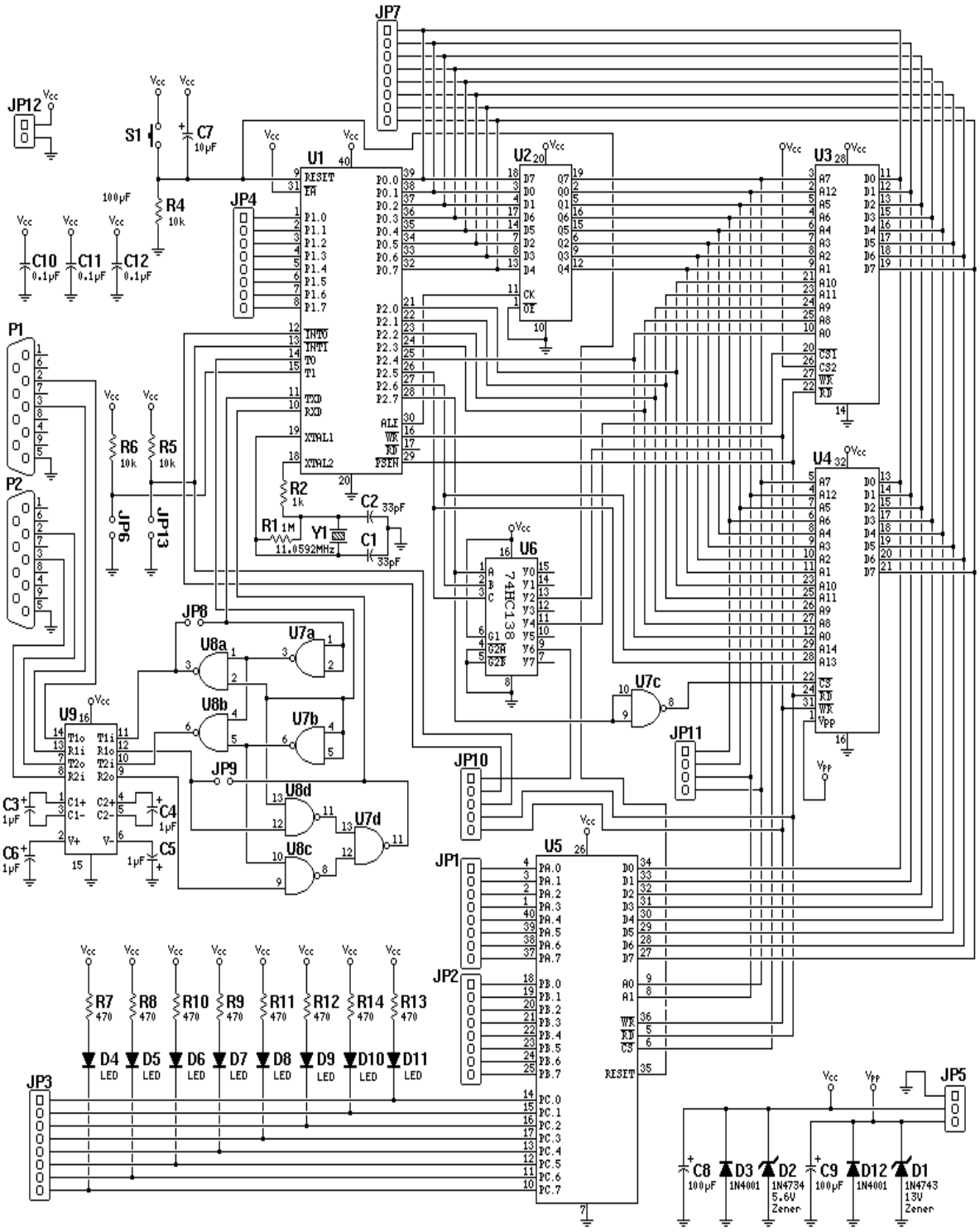

Figure 3: Problem 2 schematics

Quantity	Reference	Part
2	C1,C2	33pf
5	C3,C4,C5,C6,C7	>1uf, 16V (for the MAX232)
1	C8	100uf (>6.3 Volt)
1	C9	100uf (>16 Volt)
3	C10,C11,C12	0.1uF (Decoupling Caps)
1	D1	13V Zener, Digi-Key # 1N4743ACT
1	D2	5.6V Zener, Digi-Key # 1N4734ACT
2	D3,D12	1N4001 Rectifier Diode
8	D4,D5,D6,D7,D8,D9,D10,D11	LED, Digi-Key Part # P437
1	R1	1MEG
1	R2	1K
3	R4,R5,R6	10K
8	R7,R8,R9,R10,R11,R12,R13,R14	470 Ohm
1	U1	87C51 (or equiv)
1	U2	74HC373 (Octal Latch)
1	U3	6264 (8K x 8 SRAM)
1	U4	AM28F256 (Flash ROM)
1	U5	82C55 (I/O Chip)
1	U6	74HC138 (3:8 Decoder)
2	U7,U8	74C00
1	U9	MAX232
1	Y1	11.0592 MHz Xtal
2	P1, P2	DB-9 Female Connector, Digi-Key Part # A2100

Figure 4: Problem 2 bill of materials

Here, you can see the schematics of an unknown development board.

Design the PCB in the most efficient way you can.