# LOGIC CIRCUIT DESIGN AND IMPLEMENTATION

on the basis of a given logic function

1. Choose a proper logic function from the table:

| No. | Name | Logic Function |
|---|---|---|
| 1. | Louis Annan-Bonny | F(D,C,B,A)=Σ(4,5,7,10,13,14,15) |
| 2. | Ifeanyi Onochie Ugah | F(D,C,B,A)=Σ(0,1,3,8,10,11,12,14,15) |
| 3. | Mohammed Ali Al-Awami | F(D,C,B,A)=Σ(2,6,7,8,9,12,13,15) |
| 4. | Fatih Caskurlu | F(D,C,B,A)=Σ(0,2,3,5,6,7,8,10,11) |
| 5. | Steves Harding Deutchoua Fondjo | F(D,C,B,A)=Σ(1,5,7,8,9,12,13) |
| 6. | Anatole Raoul Egoue Toko | F(D,C,B,A)=Σ(3,6,7,8,10,12,14) |
| 7. | Yusuf Bilal Karatas | F(D,C,B,A)=Σ(2,3,4,6,7,9,11,15) |
| 8. | Jacques Etienne Mbiakop Tchouga | F(D,C,B,A)=Σ(4,6,9,11,12,13,14) |
| 9. | Imonioro Onome | F(D,C,B,A)=Σ(0,1,7,8,9,12,15) |
| 10. | Ugur Özesen | F(D,C,B,A)=Σ(0,2,6,7,8,10,11,15) |
| 11. | Recep Saltikoglu | F(D,C,B,A)=Σ(0,1,3,7,8,9,12,13,15) |
| 12. | Dinmukhamed Zardykhan | F(D,C,B,A)=Σ(0,2,4,6,8,9,11,13,15) |

2. Design an electrical circuits, which implement the logic function by under-mentioned methods:
   a) NAND network method;
   b) NOR network method;
   c) AOI (And-Or-Invert) method!

   The 2.a) task implement also by only two-input gates!

   The 2.c) task solve by any and only by existing AOI ICs!

   Propose, what method from above-mentioned ones is the cheapest, fastest and most reliable (compare pin-counts)!
3. Design and realize the logic function by Shannon function decomposition! Use 4:1 multiplexers (MUXs)! Make two solutions (4:1 MUX+gates and 4:1 MUX+2:1 MUXs)!
4. Draw the designed circuits, check their operation by TINA software! Show the simulation circuits at your written work pass!
5. Document every steps of design process!
6. From the 5 (NAND, NOR, AOI, 4:1 MUX+gates and 4:1 MUX+2:1 MUXs) circuits choose one and implement it by real circuit components (capacitors, resistors, switches, LEDs, etc.)! Check this circuit properties by TINA!

Put in written work your results and the design steps!

The **deadline** of the written work pass: 01/10/2011.

20/12/2010.

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