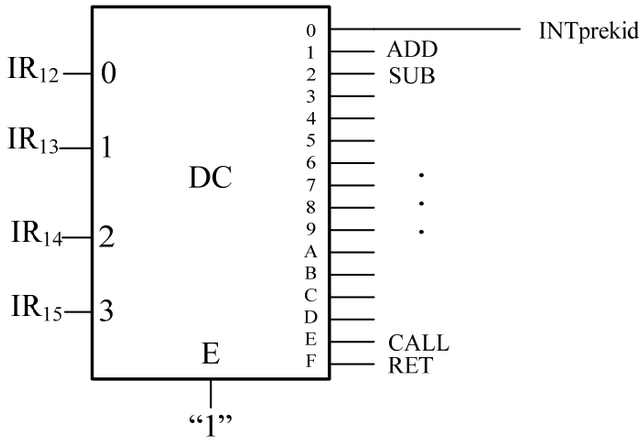
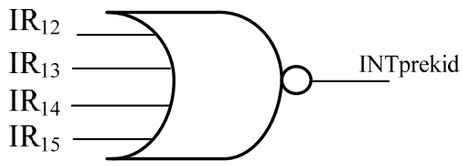
Elektrotehnički fakultet u Beogradu 10. maj 2009.
Katedra za računarsku tehniku i informatiku

Kolokvijum iz Arhitekture i organizacije računara 2

-rešenja-

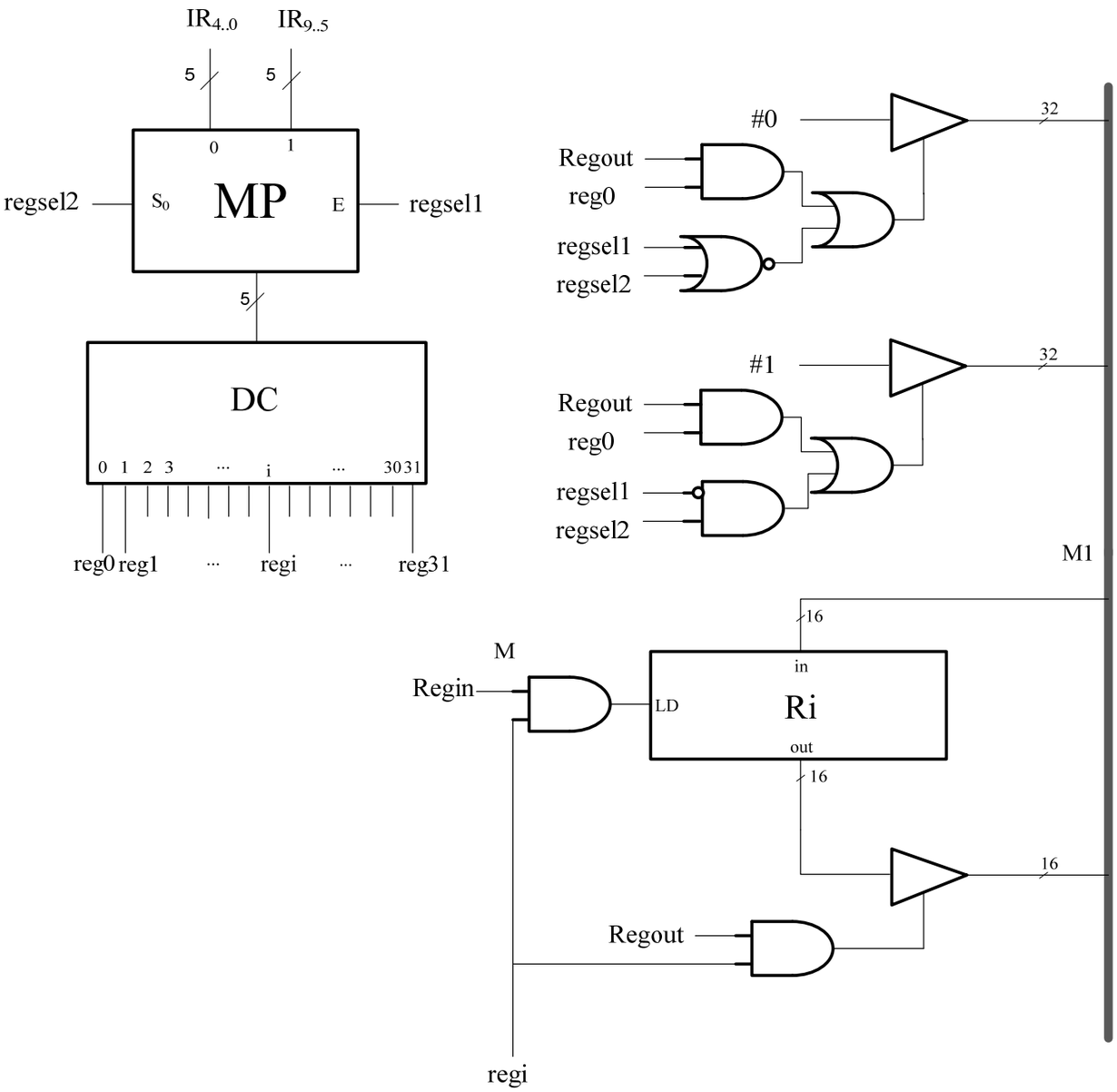
a)
Jedini kod koji ne definiše nijednu operaciju je 0h. On se može dobiti direktno iz dekodera operacija:



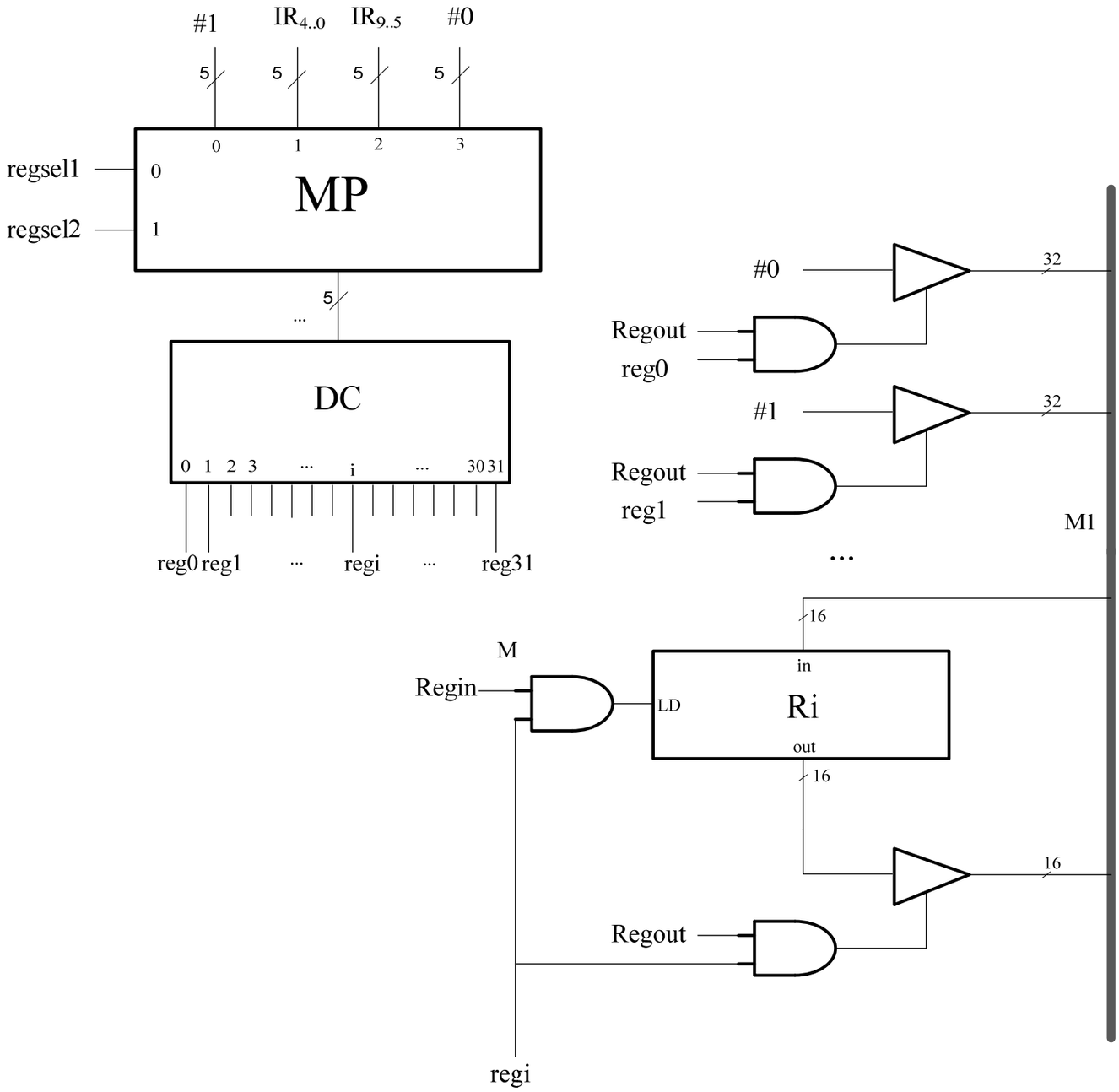


Prihvatano je (sa punim brojem poena) i rešenje sa susedne slike (koje nije idealno jer uvodi dodatno kolo bez potrebe).

b) Minimalna mreža koja realizuje zahtevanu selekciju prikazana je na slici.



Prihvatano je (sa punim brojem poena) i sledeće rešenje (koje nije minimalno zbog nepotrebne složenosti multipleksera):



c)

```
begin:      PCout, G, MARin, XM1in, TEMPin //PC->TEMP
            read, regsel2, regout, aluADD, aluOUT, XM2in //X++
            wmfc
            MDRout, IR1in
            transferA, ALUout, G, PCin, MARin, branch(INTprekid, INTHCode)
            read, regsel2, regout, aluADD, aluOUT, XM2in, branch(!I1,lab1)
            wmfc
            transferA, ALUout, G, PCin
lab1:       MDRout, IR2in, XM1in, TEMPin, opcase

ALU:        adrmodALU
regDir      regsel1, regsel2, regout, TEMPin
imm:        regsel1, regout, XM1in
            TEMPout, aluOP, aluOUT, ldPSW, XM2in, branch(!CMP,lab2)
           branch(!NMI, begin)
           bruncnd(begin)
regind:     regsel1, regsel2, regout, aluADD, aluOUT, XM2in
            transferA, ALUout, G, MARin
            read, regsel1, regout, Xin
            wmfc
            MDRout, aluOP, aluOUT, ldPSW, XM2in, branch(!CMP,lab2)
lab2:       transferA, aluOUT, G, regsel1, regin, branch(!NMI, begin)
INTH:       PCout, G, MDRin,
            SPout, G, MARin, XM2in
            write, regsel2, regout, aluADD, aluOUT, XM2in
            wmfc
            PSWout, MDRin
            transferA, aluOUT, G, MARin,
            write, regsel2, regout, aluADD, aluOUT, XM2in
```

```
           wmfc
           transferA, aluOUT, G, SPin
           IVTPout, XM1in, MARin, branch(!INTprekid, preskoci)
           regsel2, regout, aluADD, aluOUT, XM2in
           transferA, ALUout, G, MARin
preskoci:  read
           wmfc
           MDRout, PCin, bruncnd(begin)
INTCODE:   TEMPout, PCin, bruncnd(INTH)
```

d)

```
           CMP    R2,R1
           JN     END          ; ako je R2<1, idi na END
loop:      MOV    R4, R2[2FF]  ; inkrementiramo sa kraj
           ADD    R4, R1       ; da bismo koristili R2 i kao brojač
           STORE  R4, R2[2FF]
           SUB    R2, R1
           JNZ    loop
END:        …
```