

Constructed-response questions

Question 7. Add comments to the following MIPS code and describe in one sentence what it computes.

Assume that \$a0 is initially contains 5 and \$v0 is used for the output.

```
begin:  addi $t0, $zero, 0      .....
        addi $t1, $zero, 1      .....
loop:   slt $t2, $a0, $t1      .....
        bne $t2, $zero, fin     .....
        add $t0, $t0, $t1      .....
        addi $t1, $t1, 2        .....
        j loop                  .....
fin:    add $v0, $t0, $zero     .....

.....
.....
```

Question 8. What are the MIPS instructions corresponding to the following machine instructions?

```
1000 1101 0010 1000 0000 0100 1011 0000 .....
0000 0010 0100 1000 0100 0000 0010 0000 .....
1010 1101 0010 1000 0000 0100 1011 0000 .....
```

Question 9. Compile the following C program into MIPS assembly code.

```
int func (int n)      .....
{                      .....
    int i=0;           .....
    while (i<n)        .....
        i=i+1;         .....
    return i;          .....
}                      .....
.....
.....
.....
```

Question 10. Construct the full truth table described by the following Verilog module.

```
module func {A, B, C, S, D}; .....
    input A, B, C;         .....
    output S, D;           .....
    assign S=A&B&C;        .....
    assign D=(A^B) | (B^C) | (C^A); .....
endmodule                  .....
.....
.....
.....
```

Constructed-response questions

Question 7. Add comments to the following MIPS code and describe in one sentence what it computes.

Assume that \$a0 is initially contains 5 and \$v0 is used for the output.

```
begin:  addi $t0, $zero, 0      .....
        addi $t1, $zero, 1      .....
loop:   slt $t2, $a0, $t1      .....
        bne $t2, $zero, fin     .....
        add $t0, $t0, $t1      .....
        addi $t1, $t1, 2        .....
        j loop                  .....
fin:    add $v0, $t0, $zero     .....
```

.....

.....

Question 8. What are the MIPS instructions corresponding to the following machine instructions?

```
1000 1101 0010 1000 0000 0100 1011 0000 .....
0000 0010 0100 1000 0100 0000 0010 0000 .....
1010 1101 0010 1000 0000 0100 1011 0000 .....
```

Question 9. Compile the following C program into MIPS assembly code.

```
int func (int n) .....
{ .....
    int i; .....
    for (i=0;i<n;i=i+1) .....
        if (i=n) return i; .....
    } .....
```

.....

.....

.....

.....

Question 10. Construct the full truth table described by the following Verilog module.

```
module func {A, B, C, S, D}; .....
    input A, B, C; .....
    output S, D; .....
    assign S=A^B^C; .....
    assign D=(A&B)|(B&C)|(C&A); .....
endmodule .....
```

.....

.....

.....

.....