Electronics and Communication Engineering Department
National Institute of Technology Kurukshetra
Digital Design ECPC34

Time: 50 minutes. M.Marks :30

Instructions: *Both the questions are compulsory*

Q1. Consider MOD-16 synchronous counter with synchronous **LOAD** and synchronous **RESET**. Also consider 4-bit wide 2:1 multiplexer with select input **S**. Use these two components and discrete gates (**OR**, **AND** , **NOT**) to generate following sequence of counts:

0, 1, 2, 6, 7, 8, 12, 13, 14 ------- sequence repeats [15]

Q.2 Construct a 8-bit wide dedicated digital circuit to implement the algorithm given below. The circuit should output the sum of numbers when done and notify external devices that calculation is completed by asserting a ***DONE*** signal. Consider **n** an 8-bit user-input number [15]

```
sum = 0
INPUT n
WHILE (n ≠ 0){
    sum = sum + n
    n = n - 1
}
OUTPUT sum
```