

Name, Surname :
 Number :
 Course Code :
 Course Name :
 Exam : Quiz Midterm Final
 Date :

Please make sure to write your name and student number on each paper that you have used

| Question Number | 1 | 2 | 3 | 4 | 5 | Total |
|-----------------|---|---|---|---|---|-------|
| Mark | | | | | | |

Note: Exam duration is 90 minutes only.

Questions

- 1- (30p) Design the sequential circuit specified by the state table of shown below, using JK flip-flops

| Present State | | Input | Next State | |
|---------------|---|-------|------------|---|
| A | B | | A | B |
| 0 | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 1 |
| 0 | 1 | 0 | 1 | 0 |
| 0 | 1 | 1 | 0 | 1 |
| 1 | 0 | 0 | 1 | 0 |
| 1 | 0 | 1 | 1 | 1 |
| 1 | 1 | 0 | 1 | 1 |
| 1 | 1 | 1 | 0 | 0 |

- 2- (10p) Design the 3 bit full adder with using 3x8 decoder and OR gates
- 3- Draw binary counter
- (15p) two-bit Synchronous
 - (15p) four-bit Asynchronous
- 4- (15p) Implement the following Boolean function with a 8 X 1 multiplexer and external gates
- $$F(A,B,C,D) = \sum(0,2,5,7,11,14)$$
- 5- (15p) Design a Mod 9 asynchronous counter with using JK flip-flops.