

## Time: 1:00Hr

ID:

$$Start, A^+, A^-, \begin{pmatrix} B^+, Delay\ 10s, B^- \\ C^+, Delay10s, C^- \end{pmatrix}$$

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**King Saud University**  
College of Engineering  
Industrial Engineering Department

Industrial Automation IE337Mid-term Examination 2

Date: Saturday, 22/12/2012 HC

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Question 2.

- a) Developed *RLL* for Automatic machine cycle using double acting cylinder having two limit switches at the two extreme positions: *START*, *A+*, *B+*, *C+*, *B-*, *C-*, *A-*, Assume : *A*: Sustain control signal , *B* and *C*: Non-sustain control signal. 4 Marks
- b) Add the Manual (JOG) machine sequence and sketch the controller panel showing type of switches used and its functions? 2 Marks

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Question 3.

Given the following machine control sequence:

*Start,  $A^+$ , 10s delay,  $B^+$ , (repeat 4 times; ( $C^+$ ,  $C^-$ )),  $B^-$ , 20s delay,  $A^-$ .*

Develop *RLL* for the automatic cycle of the given machine sequence, assume Non-sustain control signals for all cylinders.

4 Marks