Code: 9D04205

M.Tech II Semester Supplementary Examinations August/September 2018

MECHATRONICS

(CAD/CAM)

(For students admitted in 2013, 2014, 2015 & 2016 only)

Time: 3 hours Max. Marks: 60

Answer any FIVE questions

All questions carry equal marks

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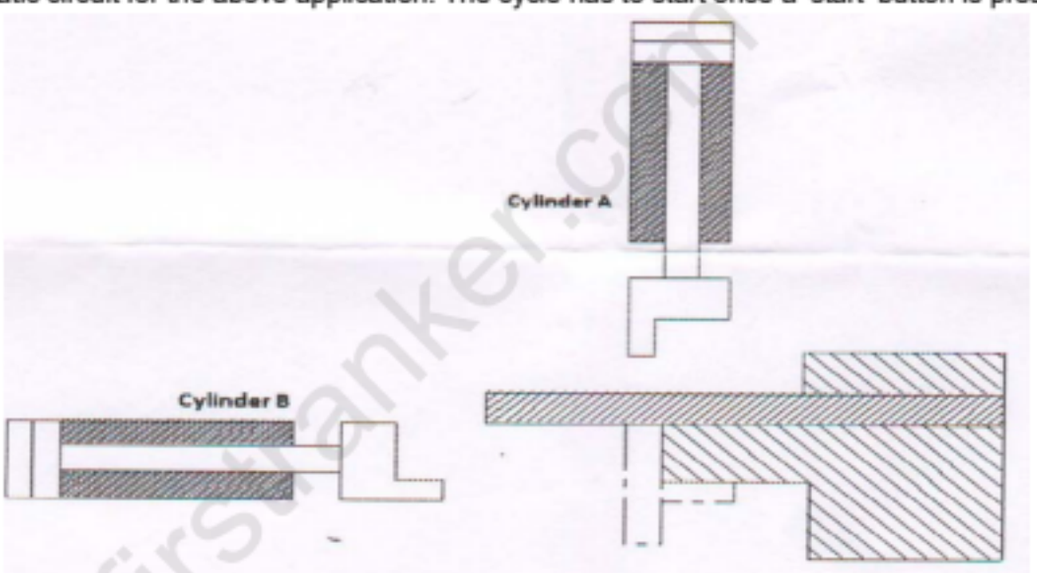
1 (a) With a block diagram, explain the elements of a mechatronic system.

(b) List the parameters to be considered for designing an intelligent mechatronic system.

2 An automobile industry needs a set-up for bending the sheet metal, as shown in dotted lines in figure below, using two actuators A and B. The sheets are clamped manually. Develop a pneumatic circuit for the above application. The cycle has to start once a 'start' button is pressed.



3 Briefly explain the motion control parameters that are required for the performance of the system.

4 Discuss briefly the following control modes.

(a) PI controllers.

(b) PID controllers.

5 Device a PLC circuit for the following application: Consider a conveyor belt that is used to transport goods from a loading machine to a packaging area. When an item is loaded onto the conveyor belt, a contact switch might be used to indicate that the item is on the belt and start the conveyor motor. The motor then has to keep running until the item reaches the far end of the conveyor and falls off into the packaging area. When it does this a switch might be activated which has the effect of switching off the conveyor motor. The motor is then to remain off until the next item is loaded onto the belt.

6 Write a program to compute the surface area required to produce a rectangular sheet metal part by giving its length and width, at screen prompts for the work piece length and width and then display the answer preceded by the words "The surface area required is"

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7 Explain the following:
(a) Internal relays.
(b) Counters.
(c) Timers.
(d) Shift registers.

7 (a) Explain the dynamic characteristics of transducers.
(b) Briefly discuss the working of a RTD sensor and its characteristics with a neat diagram.

8 Explain the basic function of a machine vision system with suitable block diagram.

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