ROLL NO.	

PRESIDENCY UNIVERSITY, BENGALURU
SCHOOL OF ENGINEERING

Max Marks: 80 | Max Time: 180 Mins | Weightage: 40 %

ENDTERM FINAL EXAMINATION

I Semester AY 2017-2018 | Course: **MEC 207 Mechatronics** | 19 Dec 2017

Instructions:

i. Write legibly
ii. Write neat sketches and label the parts.

Part A

(4 Q x 6 M= 24 Marks)

1. Explain what is meant by four bar mechanism.
2. Explain the principle of 5/2 pilot operated valve with a neat diagram.
3. Use De-Morgan's law to show that a NOR gate with inverted inputs is equivalent to an inverted AND gate.
4. Write the PLC architecture and explain its components.

Part B

(2 Q x 8 M= 16 Marks)

5. Explain the principles of operation of the variable reluctance stepper motor
6. With a neat block diagram explain how microcontroller can be used as the controller for domestic washing machine.

Part C

(2 Q x 12 M= 24 Marks)

7. Write the architecture of Intel 8051 Microprocessor and explain it.
8. Explain the following
   a. Proportional derivative control
   b. Proportional integral control

Part D

(1 Q x 16M= 16 Marks)

9. State the sequence of operation that will occur for the cylinders A and B when the start button is pressed. A^- A^+ B^- B^+ are limit switches to detect when the cylinders are fully retracted and fully extended.

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Max Marks: 40 | Max Time: 60 Mins | Weightage: 20 %

TEST 2

I Semester AY 2017-2018 | Course: **MEC 207 Mechatronics** | 27 OCT 2017

Instructions:

i. Write legibly
ii. Write neat sketches and label the parts.

Part A

(3 Q x 4 M= 12 Marks)

1. Explain how Relay can be used as a switch in electrical system, with a neat sketch.
2. Explain Integral amplifier, also indicate the expression for voltage gain.
3. With a neat sketch explain the working of hydraulic power supply unit.

Part B

(2 Q x 8 M= 16 Marks)

4. With a neat sketch, describe the working and principle of DC Motor.
5. Explain the working of the following mechanisms with a neat diagram.
   i). Quick return motion mechanism
   ii). Slider crank mechanism.

Part C

(1 Q x 12 M= 12 Marks)

6. Design a pneumatic valve circuit to give the sequence A+, followed by B+ and then simultaneously followed by A- and B-

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Max Marks: 40 | Max Time: 60 Mins | Weightage: 20 %

TEST 1

I Semester 2017-2018 | Course: **MEC 207 Mechatronics** | 16 SEPT 2017

Instructions:

i. Write legibly
ii. Write neat sketches and label the parts.

Part A

(3 Q x 4 M= 12 Marks)

1. Write two differences between active and passive transducers.

2. Define Operational Amplifier. Write the connections for inverting amplifier and expression for voltage gain of circuit.

3. Write the basic elements of closed loop system. Also explain any three elements.

Part B

(2 Q x 8 M= 16 Marks)

4. Define the following performance terminologies of a transducers, with an example
i).Range and Span
ii). Repeatability
iii). Stability
iv). Resolution

5. Explain the working of the following with a neat diagram.
i). Capacitive element/sensor
ii). Hall Effect sensor

Part C

(1 Q x 12 M= 12 Marks)

6. With a neat block diagram explain the working of basic washing machine to monitor water level, water temperature, drum speed, and door status.