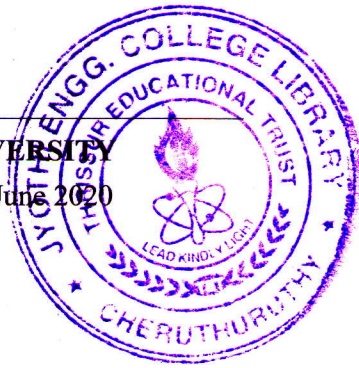


Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY  
Sixth Semester B.Tech Degree (Hons.) Examination June 2020



**Course Code: BM362**

**Course Name: MECHATRONICS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

Marks

- |   |   |      |
|---|---|------|
| 1 | a) Describe the role of mechatronics in daily life with examples?   | (5)  |
|   | b) A fluid storage tank set pressure is 5KPa. With neat sketch propose a method to maintain the set pressure? | (10) |
| 2 | a) Describe the below actuators in detail with neat sketches  | (15) |
|   | a)Cams  |      |
|   | b)Stepper motor   |      |
|   | c)Linear hydraulic actuator   |      |
| 3 | a) Discuss about the basic building blocks of a rotational mechanical system                                  | (7)  |
|   | b) Explain the role of a kinematic chain in a single cylinder crank arrangement with neat sketch              | (8)  |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |  |      |
|---|--|------|
| 4 | a) Develop the mathematical model for any electro mechanical system?       | (10) |
|   | b) Describe the role of PLC in automation with its internal block diagram? | (5)  |

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- 5 a) State the definition of a system transfer function with its properties (5)
- b) Describe the different manufacturing processes involved in MEMS manufacturing (10)
- 6 a) Compare the dynamic system response of a first order system for the below inputs (10)
- a) unit step signal
- b) unit ramp signal
- b) How is an adaptive controller different from a PID controller? (5)

**PART C**

*Answer any two full questions, each carries 20 marks.*

- 7 a) How point to point NC machines are different from contouring systems? (10)
- b) Describe the internal architecture of any robotic system. (10)
- 8 a) Comment on NC, CNC and DNC machine tools and also list down the advantages and limitations of NC, CNC and DNC machine tools. (10)
- b) How important is resolution, repeatability and accuracy in the design of a robotic manipulator? (10)
- 9 a) What are the key parameters to be considered in designing an NC machine tool and why? (10)
- b) Explain the role of robotics in biomedical engineering with existing robotic systems as examples. (10)

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