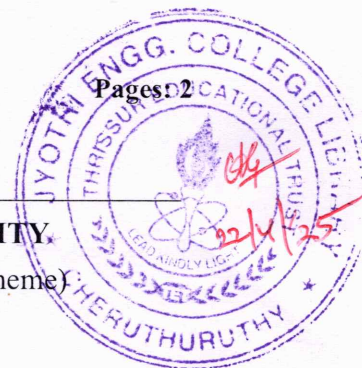


Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech S8 (R,S) / S6 (PT) (R, S) Exam April 2025 (2019 Scheme)

**Course Code: MET402****Course Name: MECHATRONICS****Duration: 3 Hours****Max. Marks: 100****PART A***Answer all questions, each carries 3 marks.*

Marks

- | | | |
|----|--|-----|
| 1 | Analyse the significance of grey codes in an absolute optical encoder. | (3) |
| 2 | Explain cushioning in pneumatic actuators. | (3) |
| 3 | Name any 3 rotary actuators used in Mechatronics. | (3) |
| 4 | What do you mean by MEMS? | (3) |
| 5 | What are the advantages of recirculating ball screws? | (3) |
| 6 | Analyse stick slip phenomenon in frictional guideways. | (3) |
| 7 | Explain XOR logic using ladder diagram & truth table. | (3) |
| 8 | What is the use of timer in Mechatronics system? | (3) |
| 9 | Analyse the functioning of a tactile sensor. | (3) |
| 10 | What do you mean by image processing? | (3) |

PART B*Answer any one full question from each module, each carries 14 marks.***Module I**

- | | | |
|----|---|----|
| 11 | a) Explain working of any one non-contact temperature measurement system. | 4 |
| | b) Analyse the key elements of a mechatronics system? | 10 |

OR

- | | | |
|----|---|---|
| 12 | a) Explain the working principle of LVDT. | 7 |
| | b) Explain working of RTD's. | 7 |

Module II

- | | | |
|----|---|----|
| 13 | a) What is LIGA process? Evaluate different steps involved in it. | 10 |
| | b) Explain DRIE process. | 4 |

OR

- 14 a) Explain working of a process control valve. 4
 b) Illustrate working of any one kind of MEMS based pressure sensor. 10

Module III

- 15 a) What are the factors to be considered while designing guideways? 4
 b) Explain most commonly used Guide ways in CNC machines 10

OR

- 16 a) What are the advantages of hydrostatic & hydro dynamic bearings? 4
 b) Explain about anti friction bearings & how it is different from other bearings. 10

Module IV

- 17 a) Explain latching in PLC programming. 4
 b) What are the basic elements of PLC? Explain with a block diagram 10

OR

- 18 a) Sketch & label the parts of pick & place robot. 4
 b) Explain working of an automatic camera. 10

Module V

- 19 a) Explain the working of CID camera. 4
 b) Explain the working of CCD camera used in machine vision system. 10

OR

- 20 a) Explain about ultrasonic & light based range finders. 4
 b) Explain various image processing techniques. 10
