REG.NO:…… MODEL QUESTION PAPER 1

NAME:……..

Seventh Semester B.Tech. Degree Examination

(2013 Scheme)

Branch: MECHANICAL ENGINEERING

13.702 MECHATRONICS (MPSU)

Time: 3 Hours **Marks: 100**

Part A

*(Answer **all** questions; each carries **2** marks)*

1. Define repeatability and reproducibility in sensors.
2. Why three concentric tracks are used in an optical incremental encoder.
3. Explain the LIGA process for MEMS fabrication.
4. What do you mean by cushioning of fluid power actuators?
5. Explain stick and slip in guideways.
6. Draw the torsional spring mass system. Write down the system equation
7. Explain latching with ladder diagram.
8. What is harmonic drive?
9. Automatic camera is a mechatronics system. Justify.
10. What is histogram of images?

(10 X 2 = 20 Marks)

Part B

(Answer any one question from each module. Each question carries 20 marks)

11.(a) Describe about resolvers and synchros.

(b) Explain the static characteristics of sensors.

(OR)

12.(a) write short notes on Pressure sensors and thermal sensor

(b)Explain various types of range finders.

13.(a) Explain the working of MEMS gyroscope.

(b)Discuss the use of different types of valves and their actuation mechanism.

(OR)

14. (a)Write short notes on Bulk manufacturing and surface manufacturing.

(b) How is sequencing done in a pneumatic system?

15. (a) With block diagram explain the architecture of a PLC.

(b) Explain ladder logic diagram of PLC.

(OR)

16.(a) Explain about linear and rotational mechanical system building blocks

(b) Describe the working of antifriction bearings.

17.(a)Design an automatic car park barrier system using PLC and pneumatic actuators.

(b)With the help of block diagram explain how a robot see an object.

(OR)

18.(a) Explain various image processing techniques.

(b) Describe AC, DC and brushless motors.

(4x20=80 Marks)

REG.NO:…… **MODEL QUESTION PAPER 2**

NAME:……..

Seventh Semester B.Tech. Degree Examination, Septemper 2016

(2013 Scheme)

Branch: MECHANICAL ENGINEERING

08.702 MECHATRONICS

Time: 3 Hours **Marks: 100**

Part A

*(Answer **all** questions; each carries **2** marks)*

1. Explain the working of an inductive proximity sensor.
2. Write short notes on acoustic emission principle and its advantages.
3. Define MEMS. List their advantages.
4. What is meant by cylinder sequencing?
5. What is the need for adaptive control.
6. Draw the PLC ladder diagram for an AND gate.
7. Explain the terms hydraulic resistance and hydraulic capacitance?
8. Explain the working of Tactile sensor.
9. Explain connectivity method in image processing.
10. Name the sensors used in a car engine management system.

(10 X 2 = 20 Marks)

Part B

(Answer any one question from each module. Each question carries 20 marks)

11.(a) Explain any three sensors used for temperature measurement.

(b) Explain the principle and operation of optical encoders.

(OR)

12.(a)Explain the construction and working of an LVDT. How can it be made to measure force?

(b) Explain the velocity sensor with suitable diagram.

13.(a) Compare wet and dry etching process. List down the advantages of MEMS.

(b)Explain the application of various types of actuators.

(OR)

14.(a)Write short notes on Bulk manufacturing and surface manufacturing.

(b) How is sequencing done in a pneumatic system?

15. (a) Discuss the factors to be considered in the selection of bearings for modern machine tools.

(b) Explain the different adaptive control methodologies.

(OR)

16.(a) Explain the different types of NC controls.

(b) Explain the mathematical model for a thermal system under conductive heat transfer.

17.(a) Explain different types of stepper motors used in mechatronics system.

(b) With the help of neat sketch explain the working of CCD cameras.

(OR)

18. Explain in detail with block diagram the engine management system and associated sensors.

(4x20=80 Marks)

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