Printed Pages:02   **Sub Code: NEN 024**

Paper Id: | 1 | 2 | 1 | 6 | 2 | 0 | **Roll No.** | | | | | | | | | | |

B.Tech
(SEM VI) THEORY EXAMINATION 2017-18
MECHATRONICS

Time: 3 Hours   *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   Attempt *all* questions in brief.   **2 x 10 = 20**

a) What do you understand by mechatronics?
b) Differentiate between conventional and mechatronics system design.
c) Define a stepper motor or stepper servomotor.
d) What do you understand by Ratchet & Pawl?
e) Explain Pneumatic and Hydraulic actuation systems.
f) Explain the concept of Buses in microprocessors.
g) Define a actuator.
h) What are gear trains?
i) Describe the types of Electric drives.
j) Explain the functions of Mechanical spring.

SECTION B

2.   Attempt any *three* of the following: **10 x 3 = 30**

a) Differentiate between a sensor and a transducer. Explain the functioning of proximity sensors.
b) Explain the functions of directional control valves & pressure control valves. Explain the applications of bearings.
c) Describe the elements of Microprocessors & Microcontrollers. Explain the key differences between the architecture of Microprocessors & Microcontrollers.
d) Explain the working principle and operation of an electromechanical disc-control mechatronics system.
e) Define Vehicle suspension Control systems. Describe the design of a Computer Printer.

SECTION C

3.   Attempt any *one* part of the following: **10 x 1 = 10**

(a) Describe the working principle of transducers. Explain the construction and working of a Displacement transducers.

(b) What do you understand by Signal conditioning? Describe the process of data acquisition systems.

4. **Attempt any *one* part of the following:** **10 x 1 = 10**

   (a) Describe what are Mechanical switches? Describe the function of a solenoid operated solid state switch.

   (b) Describe the working principle of Electrical Drives. Explain closed loop controllers

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5. **Attempt any *one* part of the following:** **10 x 1 = 10**

   (a) Explain Programmable logic controllers. Describe the Application-specific Processors (ASICS)

   (b) Explain the general Architecture of Microcontrollers. Describe the features of the Softwares that can be used for Microcontrollers.

6. **Attempt any *one* part of the following:** **10 x 1 = 10**

   (a) Explain the applications of an Industrial Robot and describe its control features.

   (b) Describe the applications of Automobile Engine Control in mechatronics. Write a case study on Automobile Engine Control.

7. **Attempt any *one* part of the following:** **10 x 1 = 10**

   (a) Explain the working principle of Micro-mechanical Systems? Explain the design of a FAX machine.

   (b) Describe the principle of operation of an NC Machine in detail. State some applications of an NC Machine.