Printed Pages:02 **Sub Code: RME 052**

Paper Id: 140502 **Roll No.** | | | | | | | | | | |

B. TECH
(SEM V) THEORY EXAMINATION 2018-19
MECHATRONICS AND MOCROPROCESSOR

Time: 3 Hours ***Total Marks: 70***

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

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a) Define Data acquisition.
b) What are the advantages of mechatronics?
c) Draw ladder logic for AND, OR and NOR gates.
d) Define open and closed loop control system.
e) What are micro actuators? What are they used for?
f) Define sensors and transducers with suitable examples.
g) Why is signal conditioning required?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a) What is an encoder? How incremental encoder is used for measuring velocity?
b) What is a sequential controller and explain with a block diagram the working of an automatic washing machine.
c) Define mechatronics. What are its objectives? Explain a block diagram the key components of a typical mechatronic system.
d) What are position sensors? Explain the working of Hall Effect sensors. Mention the advantages and applications of it.
e) What is a microcontroller? How are microcontrollers classified? Briefly explain each one of them.

SECTION C

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

a) With the help of flow chart discuss the programming process. Explain the general form of micro controller.
b) Explain with the help of a diagram the working of Engine Management System.

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

a) Discuss operating principle of NC Machine in detail. What are the basic difference between NC and CNC?
b) What are the three types of Pressure Control valve? Explain with the help of suitable diagram.

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

a) With a neat sketch explain the solenoid and state its uses. Explain the working principle of permanent magnet DC motor.
b) With the help of neat sketch, explain the working and application of Pneumatic Drive System.

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

a) Elaborate
   i. Multiplexer and counter
   ii. mnemonics

b) Discuss in brief
   i. Micro-actuators.
   ii. Autotronics.

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

a) With the help of a case study explain the working of a mechatronic system. Explain how pick and place robot works?

b) Discuss the architecture of PLC in detail. A motor is switched on by pressing a spring return push button start switch, and the motor remains on until another spring-return push button stop switch is pressed. Draw the ladder logic for the same.