

2123
B.E. (Mechanical Engineering)
Fifth Semester
MEC-505: Mechatronics

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

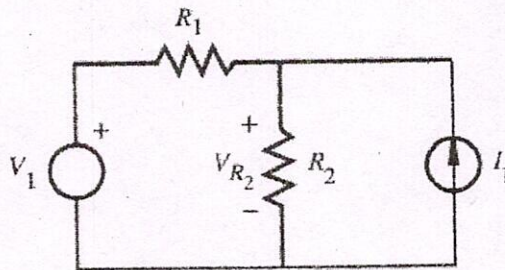
x-x-x

I. Answer the following:-

- What are the common applications of a toggle mechanism in actuation systems?
- What is the Boolean expression for the AND operation?
- What is the advantage of using a microcontroller in place of a mechanical controller?
- Draw sketches of 3/2 and 4/2 hydraulic valves.
- How does a microcontroller handle interrupts? (5x2)

UNIT - I

II. For the following circuit find V_{R_2} , considering $V_1 = 1V$, $I_1 = 1A$, $R_1 = 10\Omega$, $R_2 = 100\Omega$.



(10)

III. Discuss in detail the field effect transistor. What are the applications of MOSFETS. (10)

IV. In reference to Analog Signal Processing, write short notes on (a) Integrator, (b) Differentiator, (c) Sample and Hold circuit and (d) Comparator. (10)

UNIT - II

V. Create an inverter using a single NAND gate. Draw the schematic. (10)

VI. Discuss the PIC16F84 microcontroller architecture using a schematic diagram. (10)

VII. Write notes on:-

- Reconstruction of sampled data
- Virtual Instrumentation
- DC motors
- Stepper motor

(10)

x-x-x