



### End Term Examination (December 2019)

**School:** School of Engineering

**Program:** B.Tech (Mechatronics)

**Course:** Industrial Automation

**Course Code:** MTE402

**Semester:** VII

**Max Marks:** 40

**Duration (mins):** 90

- All questions are compulsory. Marks
- Q 1 State essential properties of hydraulic oil and draw general layout of pneumatic system. [5]
- Q 2 Sketch and explain single acting and double acting intensifiers. [5]
- Q 3 A double acting cylinder of bore 8 cm and piston rod diameter 3 cm is used to lift 5 ton of load during extension. The cylinder is mounted vertically. The weight of platform assembly is 850 k. packing friction between piston and cylinder is 150 kg. Calculate pressure valve setting and counter balance valve setting. [5]
- Q 4 Sketch and explain meter in and meter out circuit for extension. [5]
- Q 5 Sketch and explain 4/3 DCV use to operate double acting cylinder in pneumatic circuit. [5]
- Q 6 Sketch and explain hydraulic circuit to operate two single acting cylinders in sequence. [5]
- Q 7 Sketch and explain working of FRL unit components of pneumatic system. [5]
- Q 8 The displacement of a pump operating at 1500 rpm at a pressure of 75 bar is  $150 \text{ cm}^3$ . The input torque is 150Nm. If the pump delivers  $0.0020 \text{ m}^3/\text{s}$  of oil, find overall efficiency and theoretical torque. [5]

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