

Total No. of Questions – [03]

Total No. of Printed Pages: [01]

PRN No.	
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Paper Code	U222-261 (ESE)
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MAY 2022 ENDSEM EXAM
S.Y. B. TECH.(MECHANICAL) (SEMESTER - II)
COURSE NAME: INSTRUMENTATION AND CONTROL
COURSE CODE: MEUA22201
(PATTERN 2020)

Time: [1 Hr]

[Max. Marks: 30]

Instructions to candidates:

- 1) Figures to the right indicate full marks.
- 2) 'a' part of every question is compulsory
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

- Q.1 a) Explain the components in ladder diagram in detail? [4]
b) Explain When we press start counter should start counting when material passes through sensor. After counting 10 items packed inside the cartoon pump should start and push the package and reset the counter. [6]

OR

- b) Explain In a certain bank, each of the three bank officers has a unique key to the vault. The bank rules require that 2 of the 3 officers be present when the vault is opened. Develop a PLC ladder program that will unlatch the door and turn ON a light when 2 of the 3 keys are inserted. [6]

- Q2 a) Explain the advantages and disadvantages using Integral controller? [4]
b) Explain the derivation for Derivative controller and draw the circuit diagram showing this controller: [6]

OR

- b) Analyze the circuit using PID Controller in series circuit and write its transfer function [6]

- Q.3 a) Explain the advantages of Hydraulic system over pneumatic system? [4]
b) Explain Using the values of the natural frequency = **1.414** and the, damping factor = $\zeta = 0.177$, determine the values for overshoot, rise time and 2% settling time [6]

OR

- b) Explain terms zeroes and poles and its importance with respect to stability of system. [6]