



FIFTH SEMESTER B. TECH (ELECTRONICS AND INSTRUMENTATION)
PROCTORED ONLINE END SEMESTER MAKE UP EXAMINATION
FEBRUARY 2022

SUBJECT: PROCESS INSTRUMENTATION & CONTROL [ICE 3154]

TIME: 75 minutes

DATE: 26-02-2022

MAX.MARKS:20

Instructions to candidates

- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A	Derive the mathematical modelling of the mixing process with necessary diagrams	3M
1B	With a neat sketch explain the operation of static feed-forward controller design. Draw necessary diagrams	3M
1C	Write a brief note on RGA analysis and inference with different values of RGA element	4M
2A	A type-J TC with a 0°C reference is used in a proportional-mode temperature control system with a 140°C set point and a range of 100-180°C. The zero-error output should be 45%, and the PB=35%. The output is 0–10 V, and the full-scale input range is 0 to 1 V. Design an analog electronic controller.	4M
2B	What is the effect of increasing the proportional gain of a PID Controller with regard to the following criteria in a closed loop system: (i) Peak Overshoot (ii) Settling time (iii) Steady state error	3M
2C	Distinguish between ISE and IASE with regard to controller performance evaluation criteria.	3M