

J & K BOARD OF TECHNICAL EDUCATION**Semester: 5th****Branch: Electronic & Communication****Subject: Instrumentation & Programmable Logic Controllers (PLCs)****Scheme: New****Time : 3 Hrs****Session: ND22****M.M. : 100****Note:- Attempt any five Questions. All Questions carry equal marks.**

- Q1.(a)** Draw the block diagram of a generalized instrumentation system. 5 10
 Explain the function of any two of its elements.
- b)** Draw & explain the principle of operation, construction and application of X-Y recorder. 5 10
- Q2.** Explain the working principle & construction of Bimetallic Thermometer? 10 20
- Q3.** Draw & explain the block diagram of processor unit of PLC. How is memory in a PLC organised? 20
- Q4.** Discuss the constructional features & working principle of Thermistor? 10 20
- Q5.a)** Develop the ladder logic programme to realize the following Boolean functions: 10
 i) AND ii) OR
- b)** Write short notes on: 10
 i) Watchdog timer ii) Housekeeping
- Q6.** Explain the following characteristics related to instrumentation amplifier: 20
 i) input impedance ii) dc offset iii) frequency response
 iv) gain v) output impedance
- Q7.** Define PLC. Describe the similarities & differences between PLC & PC? 20
- Q8.** Explain the working principle of Strain Gauge. How is it used to measure torque and displacement? 10 20
- Q9.a)** Differentiate between primary & secondary transducers. Give suitable examples. 10
- b)** Define instrumentation amplifier. Explain its open loop gain. 10
- Q10.** Draw and explain the architecture of PLC? 20