

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BE
BRANCH: ECE**

**SEMESTER : VI/ADD
SESSION : SP/19**

SUBJECT: EC6201 INTELLIGENT INSTRUMENTATION

TIME: 3.00 Hrs.

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) What are various elements of an intelligent instrument? [2]
Q.1(b) Explain the concept of liquid flow measurement using silicon sensor. [4]
Q.1(c) Discuss the future trend in sensor technology. [6]
- Q.2(a) What are smart sensors? Explain by giving suitable example. [2]
Q.2(b) How is optical fiber used for stress sensing? Describe a micro bend sensor and discuss its operation. [4]
Q.2(c) With neat diagram explain the working of GM tube. [6]
- Q.3(a) What is a data logger? How it is different from DDC? [2]
Q.3(b) A 4-bit DAC must have an 8.00 -V output when all inputs are high. Find the required reference. [4]
Q.3(c) A sensor outputs a voltage ranging from -2.4 to -1.1V and having output impedance of 100K. For interface to an ADC, this needs to be 0 to 2.5V. Develop required signal conditioning. [6]
- Q.4(a) What do you mean by a computer supervisory control? Where it is used? [2]
Q.4(b) Discuss the structure of a direct digital control. [4]
Q.4(c) Why velocity algorithm should always include integral term? Explain integral overshoot problem and its solution. [6]
- Q.5(a) State the reason why one should use PLC instead of computer in controlling a particular process. [2]
Q.5(b) What is PLC scan cycle? Explain. [4]
Q.5(c) Write down the PLC program for Traffic Light Controller. [6]
- Q.6(a) What are the basic functional requirements of a distributed process control system? [6]
Q.6(b) How a distributed control system is configured? [6]
- Q.7(a) What is predictive control system? Give its block diagram. [2]
Q.7(b) Write down the characteristics of expert system. [4]
Q.7(c) Describe fuzzy controller using block diagram. [6]

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