Roll No. | | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Automation & Robotics) (2011 Batch)

(Sem.–7,8)

SENSORS AND SIGNAL PROCESSING

Subject Code : BTAR-701

Paper ID : [A2918]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt ANY FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt ANY TWO questions.**

SECTION-A

Q1. Write briefly :

i. List the different types of radiation sensors.

ii. Why IIR systems are called recursive systems and why feedback is required in IIR systems?

iii. What do you meant by z transform?

iv. What is the difference between analog and digital filter?

v. Define continuous time signals and classify them.

vi. What is function of Sample and Hold circuit?

vii. Why derivative (D) controller is never used alone, also list its advantages and disadvantages?

viii. List different process parameters.

ix. Name the various sensors used in the medical diagnostic.

x. Define static error, offset error and velocity error.

SECTION-B

Q2. What is Data logger? Discuss the basic data logger elements required in its construction.

Q3. Distinguish between FIR and IIR filters.

Q4. Draw the block diagram of smart sensors, and explain in detail with suitable example.

Q5. Differentiate between analog and digital filter with suitable example.

Q6. Explain the working of sample and hold circuit with neat block diagram.

SECTION-C

Q7. Compare Proportional, Integral, Proportional Integral (PI) and Proportional Integral Derivative (PID) controller.

Q8. i. Describe the Nano-sensors with suitable example also list its applications, advantages and disadvantages.

ii. Derive an expression between s- domain and z-domain using bilinear transformation. Explain frequency warping.

Q9. Write short notes on following :

i. Inverse Z Transform Methods.

ii. Design methods for FIR Filters.