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

Total No. of Questions : 18

## B.Tech. (Automation & Robotics) (2012 & Onwards)
### (Sem.–7)
# SENSORS AND SIGNAL PROCESSING
### Subject Code : BTAR-701
### M.Code : 71806

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

**Answer briefly :**

Q1. What is film sensor?

Q2. Write the equation of direct form of discrete time system.

Q3. What is data logger? Where it is used?

Q4. What is the need of amplification and filtering in signal conditioning?

Q5. What is impulse invariance?

Q6. What is the difference between frequency domain and time domain?

Q7. What is the difference between fixed point and floating point?

Q8. What do you understand bilinear transformation?

Q9. What is region of convergence in Z transform?

Q10. Where the nano sensors are used?

## SECTION-B

Q11. How smart sensors, MEMS and nano sensors differ from each other and where they are used? List applications.

Q12. What are the properties of Z transform? List and explain them.

Q13. What is the function of sample and hold circuit in data acquisition systems? Explain the difference between TDM and FDM basedb DAS.

Q14. What is finite precision effect? Elaborate.

Q15. What is a process control system? What methods are used to control a process? Why PID controller is prefered over ON OFF controller?

## SECTION-C

Q16. Explain with neat diagram single channel and multichannel data acquisition system. How modern digital data acquisition systems differ from analog data acquisition system? List some industrial applications of data acquisition system.

Q17. What are digital filters? Discuss design methods of FIR and IIR filter design with suitable diagrams.

Q18. What is the role of smart sensors in medical diagnostics and environmental monitoring? Discuss with suitable example.

**NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student**.