

B.E. / B.Tech. Instrumentation Engineering (Model Curriculum) Semester-VI  
**IN601M3 - Program Elective-II-3 : Smart Sensors**

P. Pages : 2

Time : Three Hours



**GUG/S/25/14028**

Max. Marks : 80

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- Notes :
1. All questions carry marks as indicated.
  2. Due credit will be given to neatness and adequate dimensions.
  3. Assume suitable data wherever necessary.

1. a) Describe the working of smart pressure sensors with specification of IC pressure sensor. 8
- b) What are intelligent opto sensors? Enlist their types and applications. 8

**OR**

2. a) How smart pressure sensors IC work? Give IC specifications. 8
- b) Draw basic block diagram of smart sensor system. Explain each block. 8
3. a) Explain Time division channeling in data acquisition system with suitable diagram. 8
- b) Describe classical frequency to digital conversion methods. 8

**OR**

4. a) What are the main errors of DAQ system? 8
- b) What are the methods of phase shift to digital conversion? 8
5. a) Explain DMA transfer method in detail. 8
- b) Explain Reciprocal counting method. 8

**OR**

6. a) What are the methods of advanced phase shift to digital conversion? 8
- b) What are the components of static and dynamic errors? 8
7. a) What are the design components of Virtual Tachometer System? 8
- b) How ABS (anti lock braking system) works? Discuss benefits of ABS. 8

**OR**

8. a) How a virtual instrument for a thermometer works? 8
- b) How self adaptive methods work? What are the benefits of self adaptive methods? 8
9. a) What are the optical parameters measured by sensors? Define each of them. 8
- b) Discuss the steps involved in direct sensor to microcontroller interface. 8

**OR**

10. a) Design temperature measurement system using 8
- i) Thermocouple.
- ii) RD with their applications.
- b) What is USTI(Universal Sensors and Transducers Interface)? Explain components involved in it and specify the purpose of USTI. 8

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