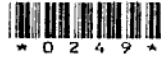


M.Sc. Fourth Semester (Applied Electronics) (New) (CBS)
15064 : Elective - I : Smart Sensors : paper - 4 AE 5

P. Pages : 2

Time : Three Hours



AV - 3322

Max. Marks : 80

- Notes :
1. Answer **three** question from Section A and **three** question from Section B.
 2. Assume suitable data wherever necessary.
 3. Illustrate your answer necessary with the help of neat sketches.
 4. Use of pen Blue/Black ink/refill only for writing the answer book.

1. a) Define and explain the notion of smart sensor. Enlist its salient features. 7
b) Draw and explain a general sensing system. 7

OR

2. a) What is the state-of-the art technology for mechanical to Electronic transitions in sensing? Explain. 7
b) Sketch and explain the effect of temperature on piezoresistive pressure sensor output. 7
3. a) Describe working principle of capacitive sensing. 6
b) What do you understand by a chemical sensor? Explain the operation of a typical gas sensor with the aid of the output characteristic curve. 7

OR

4. a) What is a Hall effect? How is it employed in sensors? 4
b) List any six common undesirable characteristics of semiconductor sensors. Also explain the design areas that are commonly used to improve these characteristics. 9
5. a) What do you understand by Inherent power supply Rejection? Explain the principles of working for a high-voltage unregulated supply. 7
b) Justify the importance of separate versus Integrated signal conditioning with respect to suitable applications. 6

OR

6. a) Explain the operating principles of Sigma-Delta ADC with the help of a neat block diagram. 7
b) Describe integrated passive and active elements for a typical sensor. 6

SECTION - B

7. a) Justify the use of DSP control in sensor applications. Explain the salient features of a typical DSP. 6
- b) Draw and explain the architecture of a typical Digital Signal Processor (DSP). 7

OR

8. a) Explain how sensor nonlinearity can be improved? 6
- b) How Is the PWM output from the micro-controller unit used in analog sensor applications? 7
9. a) What do you understand by an open-loop control system? Explain. 7
- b) What is PID control? Explain. 7

OR

10. a) What is a CISC architecture? Explain. 7
- b) What is an adaptive control? Explain its applications in smart sensors. 7
11. a) Draw and explain Radar sensor with the aid of a neat schematic. 6
- b) Explain global positioning system. 7

OR

12. a) Explain remote measurement of vehicle exhaust emissions with the aid of a neat schematic. 7
- b) Explain RFID with applications to smart sensors. 6
