Printed Pages: 01 **Sub Code: NEE405/ EE405**

Paper Id: **120245** **Roll No.** | | | | | | | | | | |

BTECH
(SEM IV) THEORY EXAMINATION 2018-19
SENSOR & INSTRUMENTATION

Time : 3 Hours ***Max. Marks : 100***

Note : *Be precise in your answers. Assume data wherever not provided.*

SECTION-A

1. Attempt all the following: **(10×2=20)**

a) What do you mean by Transducer & Inverse Transducer give example?
b) Explain different displacement sensor with examples
c) Explain Thermal resistors transducer made of semiconductor.
d) What is Gauge Factor in Strain Gauge?
e) What is the resistance of a platinum resistor at 480°C, if its resistance at 16°C is 110Ω?
f) Explain Electronic Nose system application in Food Industry.
g) Explain Slew Rate in Op- Amp.
h) Draw Sample & Hold circuit & explain its purpose in Instrumentation.
i) A pressure sensor has a span of 25 to 150 psi. Specify the error when measuring 107 psi, if the accuracy of the gauge is (a) ±1.5% of span, of reading.
j) What is the output voltage from a 4-bit *R*-2*R* DAC, if the feedback resistor is 10 k? and the network R = 5 kΩ? Assume a reference voltage of 4.8V, and a binary input of 1011.

SECTION-B

2. Attempt any **five** of the following: **(10×5=50)**

a) A barium titnate transducer has dimension 5mm X 5mm X 1.25 mm, The force acting on it is 5N, the charge sensitivity is 150pC/N & permittivity is 1.25 X 10 -3 F/m. if modulus is 12X106 N/m^2 , Find out strain also charge & capacitance.
b) Derive the Expression for Output voltage for an Active low pass filter, also find cutoff Frequency and draw its frequency response.
c) Explain the working of Hall Effect Transducer.
d) Explain the purpose of Time division multiplexing in telemetry system with block diagram.
e) What is strip chart recorder? Describe its working also write its advantages & disadvantages.
f) Explain the Working of LCD and differentiate between light scattering and field effect types of LCD.
g) Explain Working Principle of texture analyzer in Food Process Industry.
h) Explain an importance of automation and robotics in food industry

SECTION-C

Attempt any **two** of the following: **(15×2=30)**

3 a) Explain working of Thermocouple with different effect in it.
b) Draw and explain the block diagram of simple oscilloscope (CRO).

4 a) Explain Different Methods of measuring liquid levels using a capacitive transducer.
b) Explain Successive approximation type of Analog to digital converter with diagram.

5 a) Describe fruits & vegetable processing through a neat diagram.
b) Explain the difference between traditional instruments and software based virtual Instruments

www.aktuonline.com