QUESTION BANK

SUBJECT CODE / NAME: *19SB404 SENSORS, ACTUATORS AND SMART INSTRUMENTS*

IV SEM CSE (IOT &CS including BCT)

UNIT 1 – INTRODUCTION		
Sensors - Types - Characteristics - Uncertainties, precision and accuracy in measurement -Integrated smart sensors - sensing elements - design of Interface electronics - parasitic effects - sensor linearization - Dynamic range		
PART – A		
Q.No	**Questions**	**BT Level**	**Competence**
1.	What do you understand by the term Sensors?	BTL 1	Remember
2.	Conclude the purpose of measurement.	BTL 5	Evaluate
3.	The unknown resistance in a Wheatstone bridge is measured utilizing three known resistances such that $R_4 = R_2R_3/R_1$. If the values of $R_1 = 100 \pm 0.5\%\Omega$, $R_2 = 500 \pm 0.5\%\Omega$, and $R_3 = 292 \pm 0.5\%\Omega$, solve for the error in unknown resistance.	BTL 3	Apply
4.	List out the types of types of sensors	BTL 1	Remember
5.	Differentiate precision and accuracy	BTL 2	Understand
6.	Identify the types of errors in measurement.	BTL 3	Apply
7.	List out the sources of errors.	BTL 1	Remember
8.	What are the two different means adopted to avoid gross error?	BTL 1	Remember
9.	Contrast the needs between static calibration and dynamic calibration?	BTL 4	Analyze
10.	The following 10 observations were recorded when measuring a voltage: 41.7, 42.0, 41.8, 42.9, 42.1, 41.9, 42.0, 41.9, 42.5, 41.8. Estimate (a) The mean (b) The standard deviation.	BTL 6	Create
11.	Differentiate between passive and active transducers. Give an example of each.	BTL 2	Understand
12.	Compare limiting errors & component errors	BTL 2	Understand
13.	List the differences between error and uncertainty. Contrast systematic and random errors?	BTL 4	Analyze
14.	What is the inference on term inverse transducer? Give an example.	BTL 4	Analyze
15.	Identify the factors to be considered for selection of transducer for a particular application.	BTL 3	Apply
16.	Elaborate the terms 'Selectivity' and 'Specificity' of sensors.	BTL 1	Remember
17.	What are the output signals of sensors?	BTL 1	Remember
18.	Explain the importance of two wire and three wire sensors? Give typical example for each type.	BTL 5	Evaluate
19.	Classify sensors based on order and give example.	BTL 2	Understand
20.	Define Minimum Detectable Signal (MDS).	BTL 1	Remember
PART – B		
1.	Discuss about the types of errors in measurement system and explain how they are corrected? **(13)**	BTL 6	Create
2.	(i) Explain the Normal or Gaussian curve of errors. **(6)** (ii) Explain about different types of systematic error. **(7)**	BTL 2	Understand
3.	What is meant by error analysis? Explain statistical methods of error analysis with example. **(13)**	BTL 1	Remember