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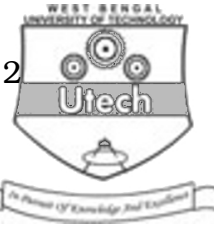
- ix) If the standard deviation of any measurement is $\pm 3\sigma$, the probability of occurrence is
- a) 0.6828 b) 0.50
c) 0.9546 d) 0.9974.
- x) A thermometer can measure the temperature from -10°C to 100°C . The scale range and scale span of the instrument are respectively
- a) -10°C to 100°C and 100°C
b) 110°C and 110°C
c) 100°C and 110°C
d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Describe the signal conditioning circuit in signal measurement system.
3. Calculate the accuracy of measuring 50 V by
 - a) a voltmeter (range 0 – 200 V d.c.) whose accuracy is 0.1% F.S. and
 - b) a voltmeter (range 0 – 100 V d.c.) whose accuracy is 2% of measured value. $2 \frac{1}{2} + 2 \frac{1}{2}$
4. Define the voltage standard. Compare and contrast between saturated and unsaturated Weston cell. $2 + 3$
5.
 - a) What is the difference between sensitivity and dead band of a measurement system ?
 - b) What is lag of a system response ?
6. What is meant by direct and indirect method of calibration ? Explain with example.



GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. For normal distribution of data, deduce the expression for probable error in terms of average deviation and standard deviation.
Explain the statement : "A measurement data is specified within $\pm 3\sigma$ limit".
What are the basic methods of rejecting the data ? $10 + 3 + 2$
8. What are different standards available on total quality management system ? Discuss the structures of different standards. $5 + 10$
9. Write short notes on any *three* of the following : 3×5
- a) Precision and accuracy
 - b) Current standard
 - c) Least square method
 - d) Reliability of measurement.
10. a) What is the difference between dynamic and static characteristics of an instrument ? 3
- b) Why is analysis of dynamic characteristic essential for a system ? 3
- c) Calculate the following for a first order system of step input : 9
- i) Steady state error
 - ii) Dynamic error
 - iii) Settling time.
11. What are the different types of error in a measurement system ? Discuss the sources of these errors and the techniques of elimination or reduction of these errors. $5 + 5 + 5$

