

## Multiple-Choice Test

### Chapter 01.06 Propagation of Errors

- If  $A = 3.56 \pm 0.05$  and  $B = 3.25 \pm 0.04$ , the values of  $A + B$  are
  - $6.81 \leq A + B \leq 6.90$
  - $6.72 \leq A + B \leq 6.90$
  - $6.81 \leq A + B \leq 6.81$
  - $6.71 \leq A + B \leq 6.91$
- A number  $A$  is correctly rounded to 3.18 from a given number  $B$ . Then  $|A - B| \leq C$ , where  $C$  is
  - 0.005
  - 0.01
  - 0.18
  - 0.09999
- Two numbers  $A$  and  $B$  are approximated as  $C$  and  $D$ , respectively. The relative error in  $C \times D$  is given by
  - $\left| \frac{A-C}{A} \right| \times \left| \frac{B-D}{B} \right|$
  - $\left| \frac{A-C}{A} \right| + \left| \frac{B-D}{B} \right| + \left| \frac{A-C}{A} \right| \times \left| \frac{B-D}{B} \right|$
  - $\left| \frac{A-C}{A} \right| + \left| \frac{B-D}{B} \right| - \left| \frac{A-C}{A} \right| \times \left| \frac{B-D}{B} \right|$
  - $\left( \frac{A-C}{A} \right) - \left( \frac{B-D}{B} \right)$
- The formula for normal strain in a longitudinal bar is given by  $\epsilon = \frac{F}{AE}$  where
  - F = normal force applied
  - A = cross-sectional area of the bar
  - E = Young's modulusIf  $F = 50 \pm 0.5 \text{ N}$ ,  $A = 0.2 \pm 0.002 \text{ m}^2$ , and  $E = 210 \times 10^9 \pm 1 \times 10^9 \text{ Pa}$ , the maximum error in the measurement of strain is
  - $10^{-12}$
  - $2.95 \times 10^{-11}$
  - $1.22 \times 10^{-9}$
  - $1.19 \times 10^{-9}$

5. A wooden block is measured to be 60 mm by a ruler and the measurements are considered to be good to 1/4th of a millimeter. Then in the measurement of 60 mm, we have \_\_\_\_\_ significant digits.
- (A) 0
  - (B) 1
  - (C) 2
  - (D) 3
6. In the calculation of the volume of a cube of nominal size 5", the uncertainty in the measurement of each side is 10%. The uncertainty in the measurement of the volume would be
- (A) 5.477%
  - (B) 10.00%
  - (C) 17.32%
  - (D) 30.00%

For a complete solution, refer to the links at the end of the book.