

**QUESTION 3 (25 MARKS)**

**Question 3 (a)**

$$\sin 30^\circ = \frac{h}{10} \Rightarrow h = 10 \sin 30^\circ = 5 \text{ m}$$

**Question 3 (b)**

$$\tan 30^\circ = \frac{5}{x} \Rightarrow x = \frac{5}{\tan 30^\circ} = 5\sqrt{3} \text{ m}$$

$$d = 5\sqrt{3} - 3 = 5.66 \text{ m}$$

**Question 3 (c)**

$$\tan \alpha = \frac{5}{5.66} \Rightarrow \alpha = \tan^{-1}\left(\frac{5}{5.66}\right) = 41.46^\circ$$

**Question 3 (d)**

$$\sin \alpha = \frac{5}{y}$$

$$\sin 41.46^\circ = \frac{5}{y}$$

$$y = \frac{5}{\sin 41.46^\circ} = 7.55 \text{ m}$$

Length of ladder protruding beyond the top of the wall =  $10 - 7.55 = 2.45 \text{ m}$

