



NAME: .....

CLASS: .....

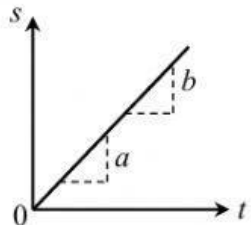
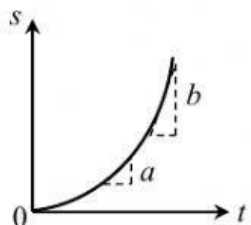
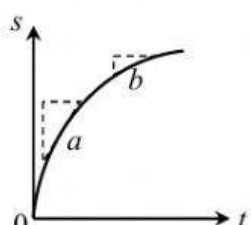
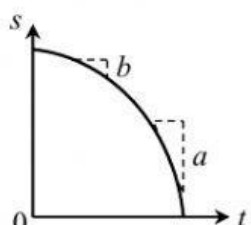
## CHAPTER 2: KINEMATICS OF LINEAR MOTION

1. Connect the dots to sketch the graph of  $v-t$  and  $a-t$  for an object in linear motion.

| No. | Graph of $s-t$ | Graph of $v-t$ | Graph of $a-t$ |
|-----|----------------|----------------|----------------|
| (a) |                |                |                |
| (b) |                |                |                |
| (c) |                |                |                |
| (d) |                |                |                |

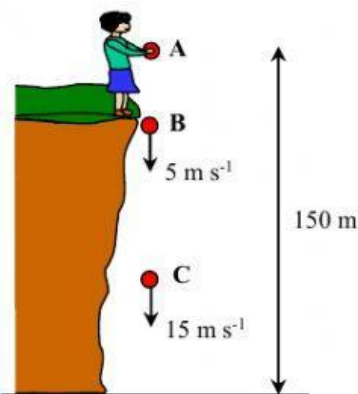
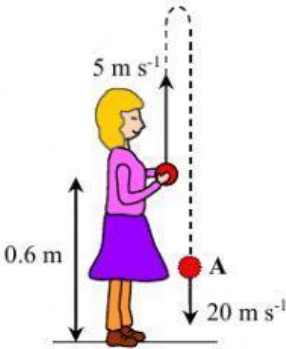
## 2. Linear Motion Graph Analysis

Choose a **suitable word** to complete the sentences in the table below.

| No. | Graph of $s - t$                                                                    | Graph Analysis                                                                                                                                                                                                                                                                                                                                                    |
|-----|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (a) |    | <p>Gradient of <math>s - t</math> graph represents <u>velocity</u>.</p> <p>Gradient of <math>s - t</math> graph is <b>constant / increasing / decreasing</b> from <math>a</math> to <math>b</math>.</p> <p>Hence, the velocity is <b>constant / increasing / decreasing</b> from <math>a</math> to <math>b</math>.</p> <p>The value of acceleration is _____.</p> |
| (b) |   | <p>Gradient of <math>s - t</math> graph is <b>positive / negative</b> and the value is <b>constant / increasing / decreasing</b> from <math>a</math> to <math>b</math>.</p> <p>Hence, the velocity is <b>constant / increasing / decreasing</b>.</p> <p>The object is <b>accelerating / decelerating</b>.</p>                                                     |
| (c) |  | <p>Gradient of <math>s - t</math> graph is <b>positive / negative</b> and the value is <b>constant / increasing / decreasing</b> from <math>a</math> to <math>b</math>.</p> <p>Hence, the velocity is <b>constant / increasing / decreasing</b>.</p> <p>The object is <b>accelerating / decelerating</b>.</p>                                                     |
| (d) |  | <p>Gradient of <math>s - t</math> graph is <b>positive / negative</b> and the value is <b>constant / increasing / decreasing</b> from <math>a</math> to <math>b</math>.</p> <p>Hence, the velocity is <b>constant / increasing / decreasing</b>.</p> <p>The object is <b>accelerating / decelerating</b>.</p>                                                     |

3. **Free fall motion** is a vertical motion of a body under the influence of \_\_\_\_\_ force only.

4. Choose the correct answer from the dropdown

| Cases                                                                                                    | Analysis                                                                                                      |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| <p><b>Case 1</b></p>   | <p>An object is <b>released</b> from point A.</p> <p><math>u =</math></p>                                     |
|                                                                                                          | <p>Displacement of the object from initial position to the ground.</p> <p><math>s = -150 \text{ m}</math></p> |
|                                                                                                          | <p>Velocity of the object when it reaches <b>point B</b>.</p> <p><math>v_B =</math></p>                       |
|                                                                                                          | <p>Velocity of the object when it reaches <b>point C</b>.</p> <p><math>v_C = -15 \text{ m s}^{-1}</math></p>  |
| <p><b>Case 2</b></p>  | <p>Object is <b>thrown</b> vertically <b>upward</b>.</p> <p><math>u =</math></p>                              |
|                                                                                                          | <p>Displacement of the object from initial position to the ground.</p> <p><math>s =</math></p>                |
|                                                                                                          | <p>Velocity of the object when it reaches the <b>maximum height</b>.</p> <p><math>v =</math></p>              |
|                                                                                                          | <p>Velocity of the object when at <b>point A</b>.</p> <p><math>v_A =</math></p>                               |

5. A marble is **thrown** vertically **downward** at  $5 \text{ m s}^{-1}$  from a height of 15 m. Calculate the

(a) speed of the object just before it hits the ground.

$$v_y^2 = u_y^2 - 2gs_y$$

$$v_y^2 = ( \quad ) - 2g( \quad )$$

$$v_y^2 = \underline{\hspace{2cm}} \text{ m}^2 \text{ s}^{-2}$$

$$v_y = \pm \underline{\hspace{2cm}} \text{ m s}^{-1}$$

$$v_y = \underline{\hspace{2cm}} \text{ m s}^{-1}$$

(b) time taken by the object to reach the ground.

$$s_y = u_y t - \frac{1}{2} g t^2$$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}} t - \frac{1}{2} (\underline{\hspace{2cm}}) t^2$$

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}} t - (\underline{\hspace{2cm}}) t^2$$

$$\underline{\hspace{2cm}} t^2 + \underline{\hspace{2cm}} t - \underline{\hspace{2cm}} = 0$$

$$t = \underline{\hspace{2cm}}$$