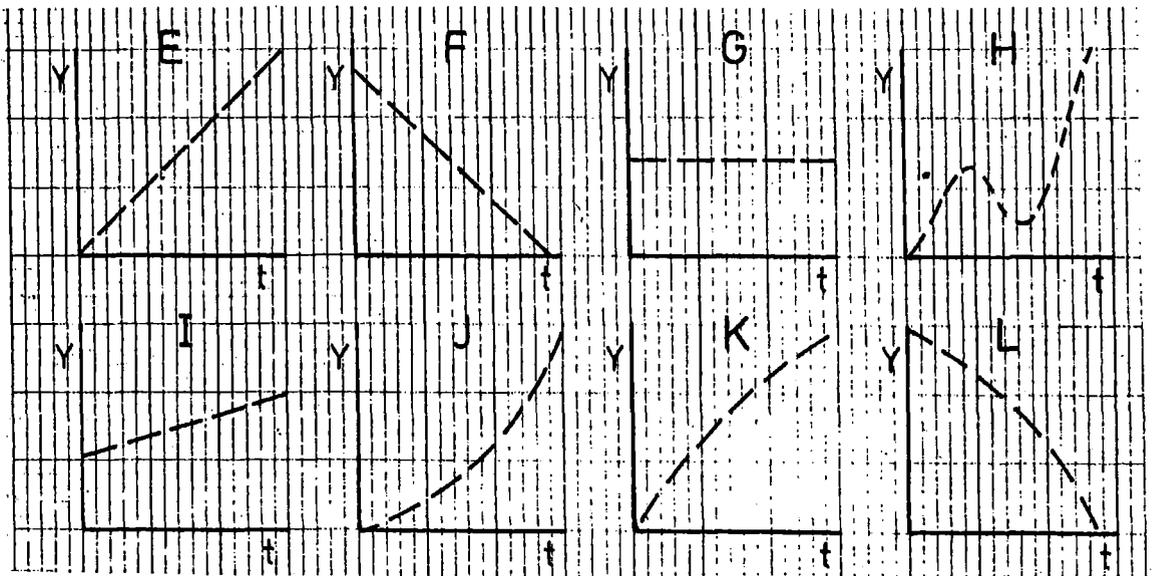


# INTERPRETING MOTION GRAPHS - 1

This test is designed to measure your ability to interpret the shapes of motion graphs. In each question select the correct answer and write its letter (A, B, C or D) on your answer sheet.

The questions refer to the graphs below. Each graph represents a portion of the motion of an object moving in a straight line.



**Set 1** Displacement/Time Graphs In this set, the y axis represents displacement. For each question, choose the graph which best fits the description given.

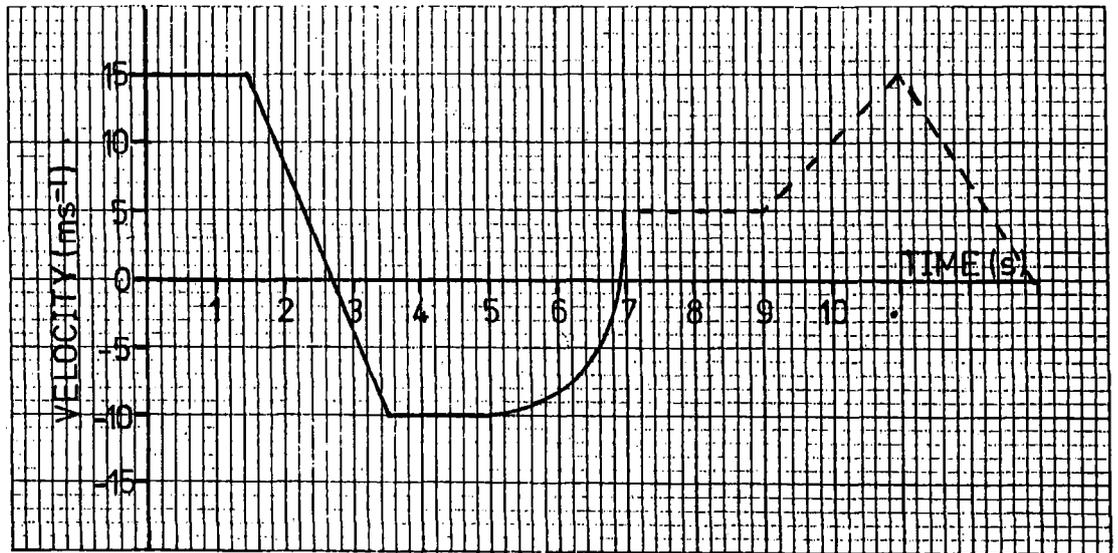
Question	Description An object moving with:	Graph			
		A	B	C	D
1	zero velocity (i.e. stationary)	E	F	<b>G</b>	H
2	constant (uniform) velocity	<b>E</b>	G	J	K
3	non-uniform velocity	F	G	<b>H</b>	I
4	increasing velocity	H	I	<b>J</b>	K
5	decreasing velocity	F	H	J	<b>K</b>

**Set 2** Velocity/Time Graphs In this set, the y axis represents velocity. For each question, choose the graph which best fits the description given.

Question	Description An object moving with:	Graph			
		A	B	C	D
6	constant velocity	F	<b>G</b>	H	I
7	increasing velocity	F	H	<b>I</b>	L
8	constant acceleration	<b>E</b>	G	J	K
9	increasing acceleration	E	F	H	<b>J</b>
10	decreasing acceleration	F	I	J	<b>K</b>

## INTERPRETING MOTION GRAPHS - 2

This test is designed to measure your ability to interpret a motion graph. The questions refer to the graph below:



The graph shows the velocity of an object over a period of time.

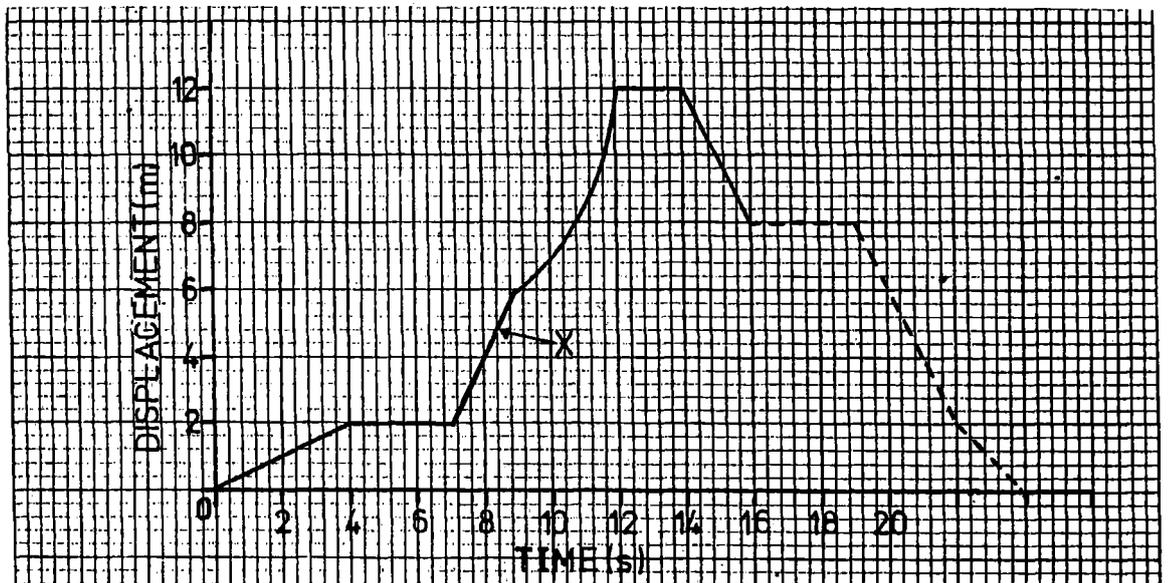
- a) When (if ever) is the object stationary? 2.7 and 6.9 sec.
- b) What is the maximum velocity of the object? 15 ms<sup>-1</sup>
- c) What is the minimum velocity of the object? zero
- d) What is the displacement of the object at 2.7 seconds? zero
- e) What is its displacement at 6.9 seconds? ✓ 31.5 m
- f) What is its maximum displacement? 31.5 m
- g) What is the velocity of the object at  $t = 4$ ? -10 ms<sup>-1</sup>
- h) What does the area under the graph represent? displacement
- i) What does the slope of the graph represent? acceleration
- j) What was the average velocity of the object? ✓ -0.1 ms<sup>-1</sup>
- k) What was the instantaneous acceleration of the object at time  $t = 2$ ? -12.5 ms<sup>-2</sup>
- l) When is the acceleration zero? from 1 → 2 sec 3.5 → 5 sec
- m) When is the acceleration negative? 1.5 → 3.5 sec
- n) What the magnitude of this acceleration? 12.5
- o) When is the acceleration positive? from 5 → 7 sec
- p) What is its average value for this period? 7.5 ms<sup>-1</sup>
- q) What total distance did the object travel? ✓ 64 m

Continue the graph using the following information:

- r) the object continues on its journey with zero acceleration for 2 seconds
- s) it then accelerates at  $5\text{ms}^{-2}$  for 2 seconds
- t) After 2 seconds of uniform acceleration the object is stationary.

## INTERPRETING MOTION GRAPHS - 3

This test is designed to measure your ability to interpret motion graphs. The questions refer to the two graphs below:



The graph shows the displacement of an object over a period of time.

- a) How long did it take the object to travel 6 metres? 9 sec
- b) How long did it take the object to travel the last 6 metres of its journey? 4.2 sec
- c) What total distance was travelled by the object? 16 m
- d) What is its displacement after 16 seconds? 8 m
- e) How far is it displaced between  $t = 6$  and  $t = 16$ ? 6 m
- f) What is the instantaneous velocity of the object at position  $x$ ?  $2 \text{ m s}^{-1}$
- g) When is the object stationary?  $4 \rightarrow 7 \text{ sec}$  and  $12 \rightarrow 14 \text{ sec}$
- h) What is the highest constant velocity of the object?  $2 \text{ m s}^{-1}$
- i) What is the acceleration of the object at  $X$ ? zero
- j) What is the average velocity of the object?  $0.5 \text{ m s}^{-1}$
- k) What is represented by the area under the graph? nothing
- l) When was the velocity negative? from  $t = 14$  to  $t = 16$
- m) What is the magnitude of the negative velocity?  $2 \text{ m s}^{-1}$
- n) How far did the object travel between  $t = 12$  and  $t = 14$ ? 0 m
- o) What does the slope of the graph represent? velocity
- p) What does a slope of zero represent? object is stationary
- q) Where is the slope zero?  $t = 4 \rightarrow 7$  and  $t = 12 \rightarrow 14 \text{ sec}$

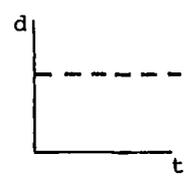
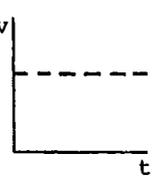
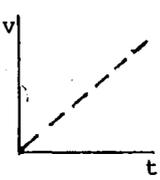
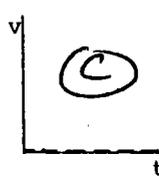
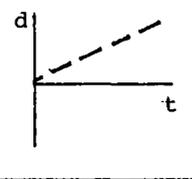
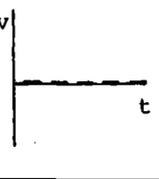
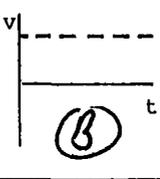
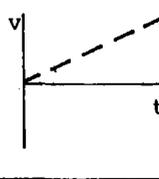
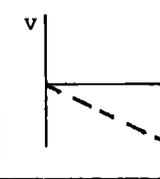
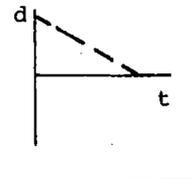
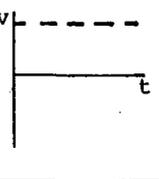
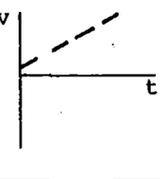
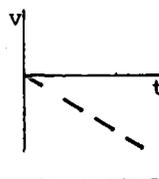
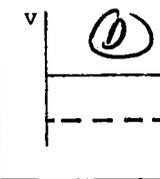
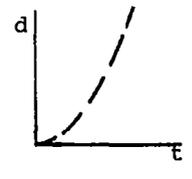
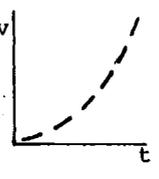
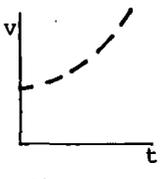
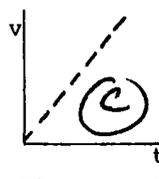
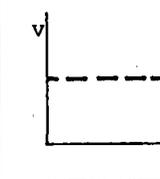
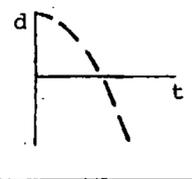
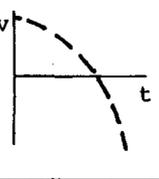
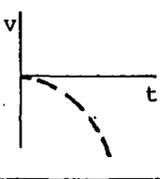
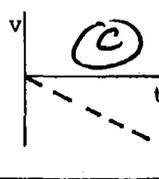
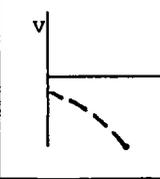
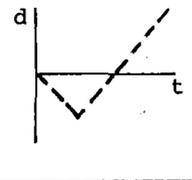
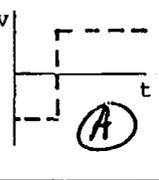
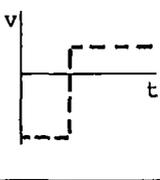
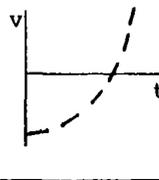
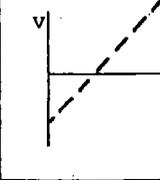
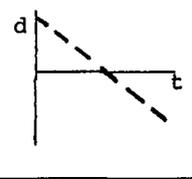
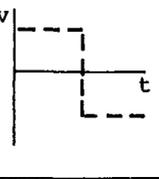
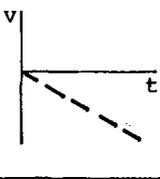
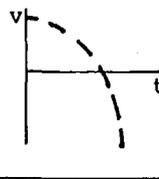
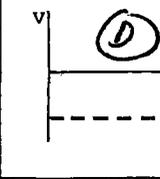
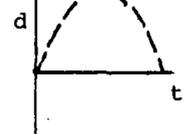
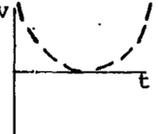
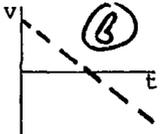
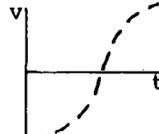
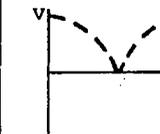
Continue drawing the graph using this information:

- r) for the next 3 seconds the object was stationary.
- s) it then headed towards home at 2 metres per second.
- t) after 3 seconds, it slowed down to 1 metre per second until it reached home.

# INTERPRETING MOTION GRAPHS - 7

This test is designed to measure your ability to change a displacement/time graph to a velocity/time graph. For each question select the correct answer and write its letter (A, B, C or D) on your answer sheet.

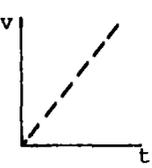
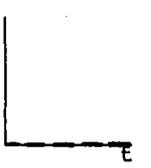
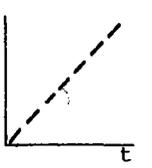
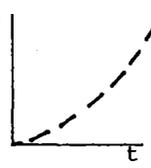
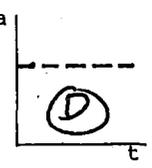
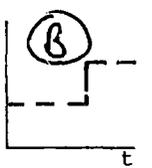
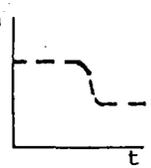
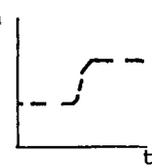
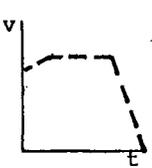
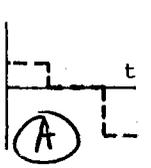
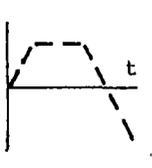
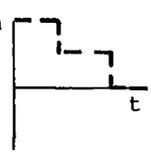
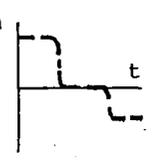
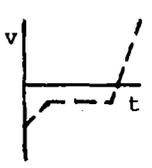
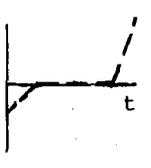
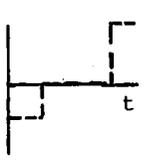
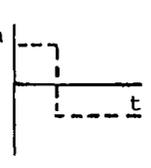
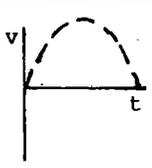
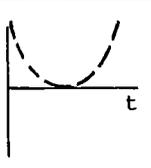
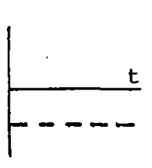
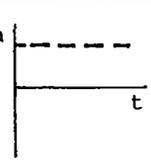
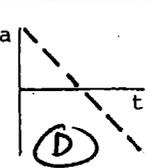
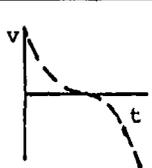
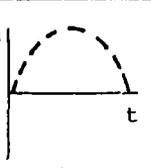
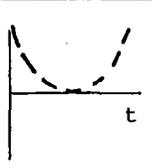
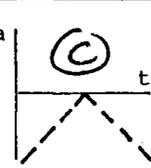
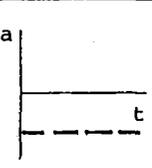
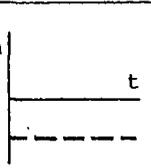
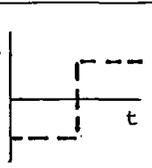
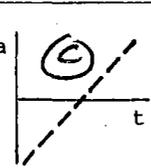
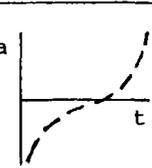
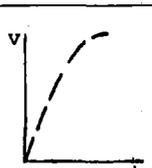
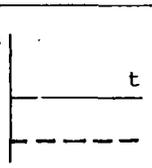
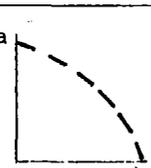
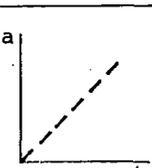
For each displacement/time graph choose the graph which best represents this motion on a velocity/time graph.

Q	Displacement/ Time Graph	Equivalent Velocity/Time Graph			
		A	B	C	D
1					
2					
3					
4					
5					
6					
7					
8					

## INTERPRETING MOTION GRAPHS - 8

This test is designed to measure your ability to change a velocity/time graph. For each question select the correct answer and write its letter (A, B, C or D) on your answer sheet.

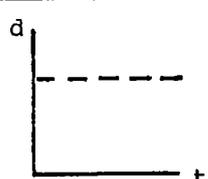
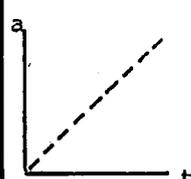
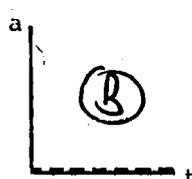
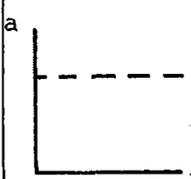
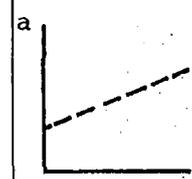
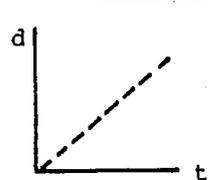
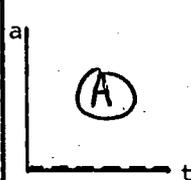
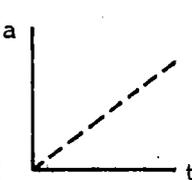
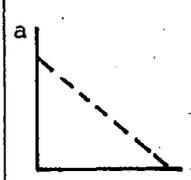
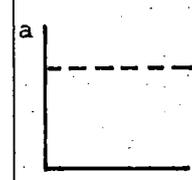
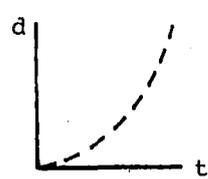
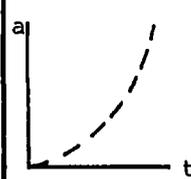
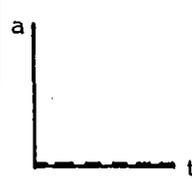
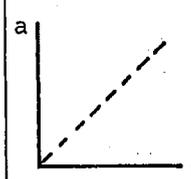
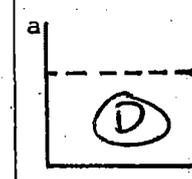
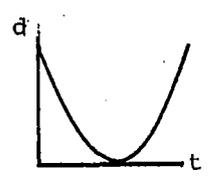
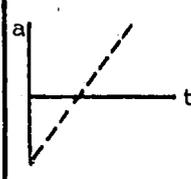
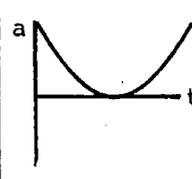
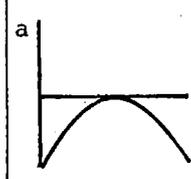
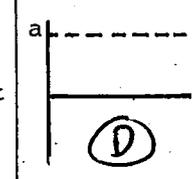
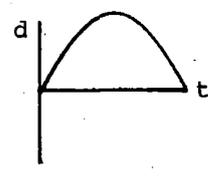
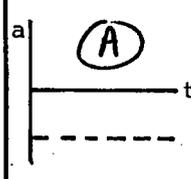
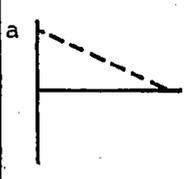
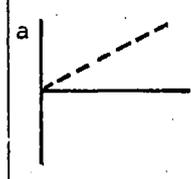
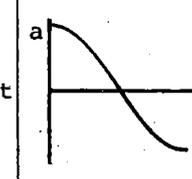
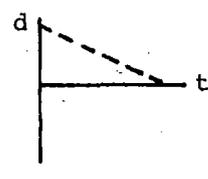
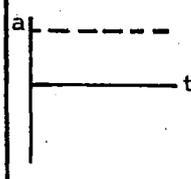
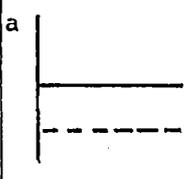
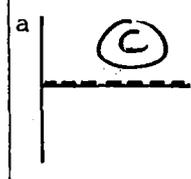
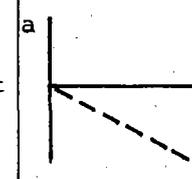
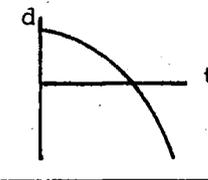
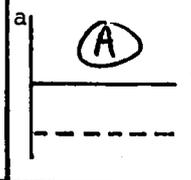
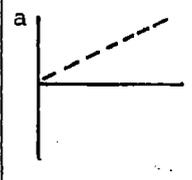
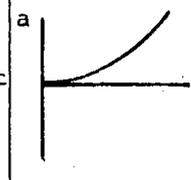
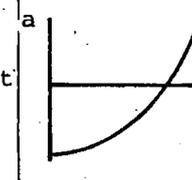
For each velocity/time graph, choose the graph which best represents this motion on an acceleration/time graph.

Q	Velocity/ Time Graph	Equivalent Acceleration/Time Graph			
		A	B	C	D
1					 (D)
2			 (B)		
3		 (A)			
4					 (D)
5					 (D)
6				 (C)	
7				 (C)	
8		 (A)			

## INTERPRETING MOTION GRAPHS - 9

This test is designed to measure your ability to change a displacement/time graph to an acceleration/time graph. For each question select the correct answer and write its letter (A, B, C or D) on your answer sheet.

For each displacement/time graph shown, choose the graph which best represents this motion on an acceleration/time graph.

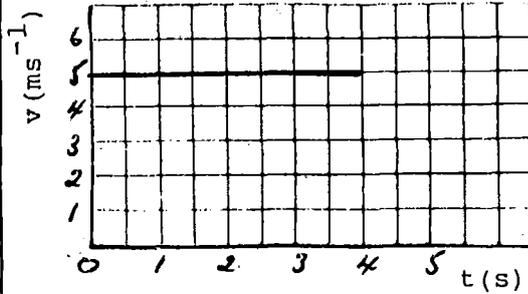
		Equivalent Acceleration-Time Graph			
Q	Displacement Time Graph	A	B	C	D
1			 (B)		
2		 (A)			
3					 (D)
4					 (D)
5		 (A)			
6				 (C)	
7		 (A)			

# DRAWING MOTION GRAPHS

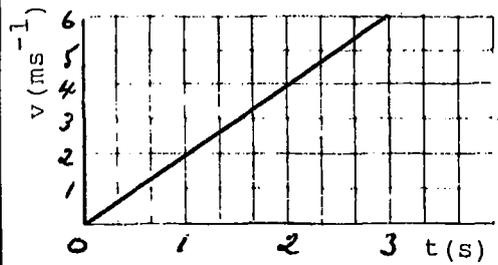
This test is designed to measure your ability to draw graphs of the motion of various objects.

In each space provided, draw a graph which represents the motion of the object as described in each space.

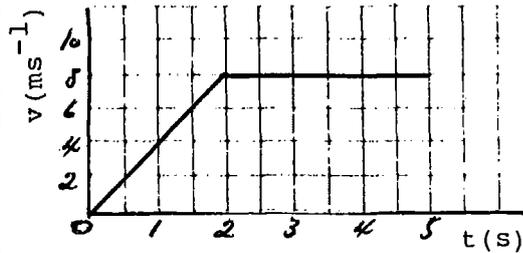
1. Object travels uniformly for 4 seconds at  $5 \text{ ms}^{-1}$ .



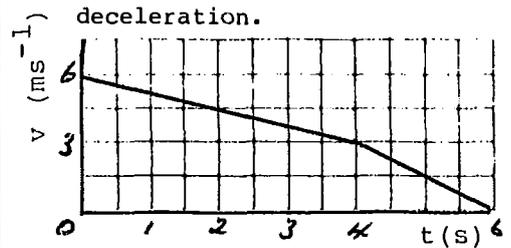
2. Object starts from rest and accelerates at  $2 \text{ ms}^{-2}$  for 3 seconds.



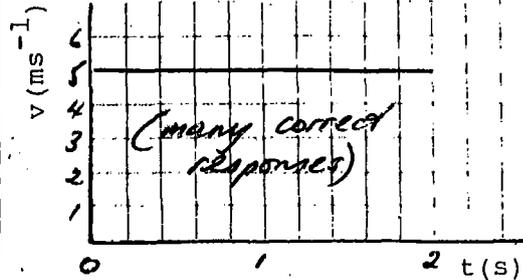
3. Object starts from rest and accelerates at  $4 \text{ ms}^{-2}$  for 2 seconds then travels uniformly for 3 seconds.



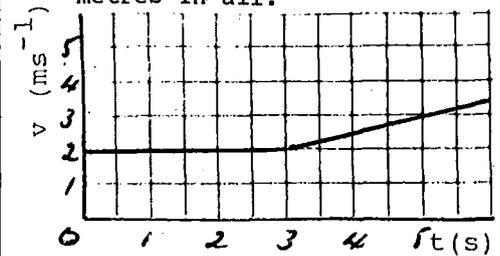
4. Object starts at  $6 \text{ ms}^{-1}$  and slows down to  $3 \text{ ms}^{-1}$  in 4 seconds. It stops after another 2 seconds of uniform deceleration.



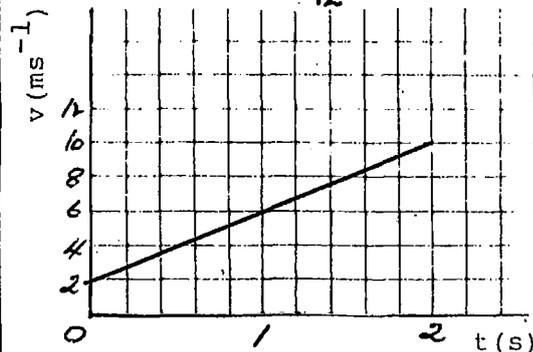
5. Object moves with uniform velocity and travels 10 metres.



6. Object moves at  $2 \text{ ms}^{-1}$  for 3 seconds, then accelerates for 3 seconds. It travels 14 metres in all.



7. Object starts at  $2 \text{ ms}^{-1}$  and accelerates uniformly until it has travelled 16 metres.



8. Object starts from rest and accelerates uniformly for 2 seconds. It then travels with constant velocity for 2 seconds. It travels a total of 10 metres.

