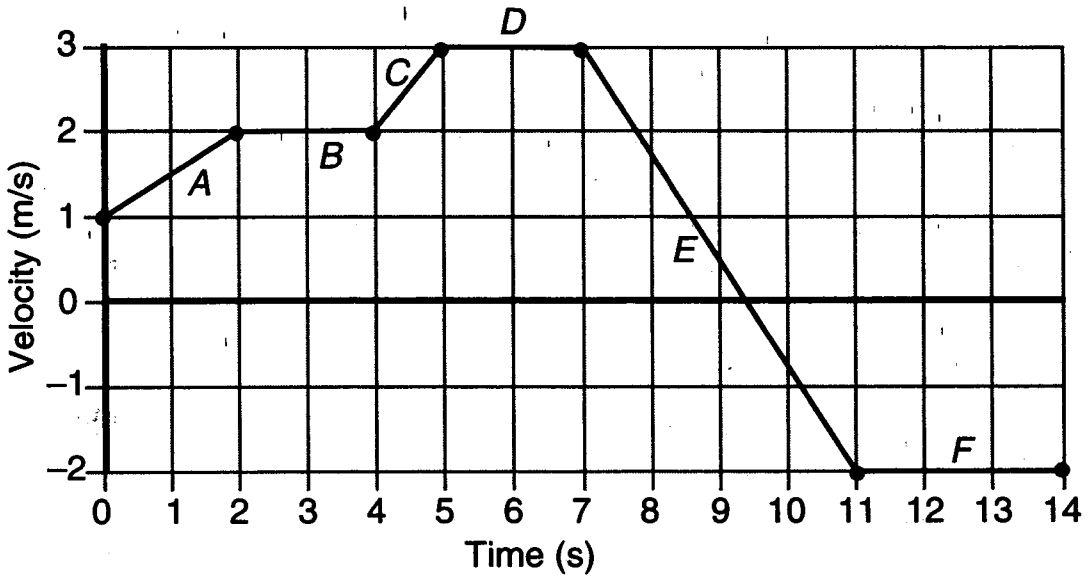
NAME OF STUDENT: _____

DATE _____ PERIOD: _____

Velocity–Time and Acceleration–Time Graphs

The graph below illustrates the velocity of an object as a function of time.



The values on the *y*-axis represent the *instantaneous* velocities of the object at the times marked on the *x*-axis. It is as though we were looking at a car's speedometer at various times. We have divided the graph into six sections: *A, B, C, D, E* and *F*. Since each section is a straight-line segment, the object's acceleration within each section is *constant.* We will learn how to interpret this graph by considering the following problem.

PROBLEM

1. What is the average velocity within each section of the graph?
2. What is the acceleration within each section of the graph?
3. When does the object come to rest?
4. When does the object reverse the direction of its motion?
5. What is the displacement within each section of the graph?
6. What is the displacement over the entire trip (0–14 seconds)?
7. What is the average velocity over the entire trip (0–14 seconds)?
8. What is the shape of the corresponding *acceleration versus time* graph?

Probs Velocity-Time Graphs

① Avg Vel.	② Accel	③ Displacement
A. 1.5 m/s	.5 m/s²	3 m
B. 2 m/s	0 "	4 m
C. 2.5 m/s	1 "	2.5 m
D. 3 m/s	0 "	6 m
E. 1/2 m/s	-1.25 m/s²	2.25 m
F. -2 m/s	0 "	-6 m

③ Rest ≈ 9.5s

④ > 9.5s

⑤ Total Disp. = 11.75m

⑦ $\bar{v} = \frac{v_i + v_f}{2} = \frac{1 + -2}{2} = -\frac{1}{2}$ m/s

⑧