

SECTION A

Attempt ALL questions.

You MUST write your answers in this answer booklet.

1. (a) Using electronic timing the following data in Table 1 was obtained for a steel ball bearing falling from rest. Use the data to plot a suitable straight line graph (on page 5) to determine the value of, g , the acceleration of free fall. [6 marks]

TABLE 1

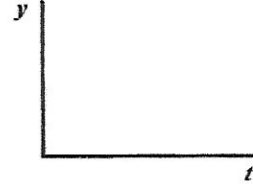
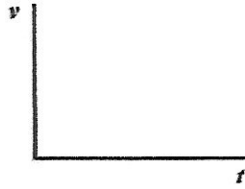
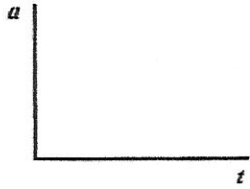
Distance, y/m	Time, t/s	t^2/s^2
± 2 mm	± 2 ms	–
0.400	0.281	
0.600	0.342	
0.800	0.414	
1.000	0.456	
1.200	0.500	
1.400	0.534	

Working for determination of g .

[3 marks]

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- (b) On the axes below sketch graphs (using down as positive) to show how the acceleration, a , velocity, v , and displacement, y , of the falling steel bearing vary with time.



[3 marks]

- (c) Using $g = 9.8 \text{ m s}^{-2}$ rather than the value from (a), find the velocity of the steel bearing after it has fallen a distance of 0.90 m.

[3 marks]

Total 15 marks