


Section - C		
8	A body of mass m suspended from an ideal spring is executes simple harmonic oscillations The force constant of the spring(F/L)_ is k and the time period of the body is T show by dimensional method that the formula $T = 2\pi m/k$ is incorrect. Establish its correct form.	3
Section - D (CASE STUDY)		
9	<p>To solve the mathematical problems of physical quantities, it is important to have a brief knowledge of units and dimensions. The basic concept of dimensions is that only those quantities can be added or subtracted which have the same dimension. This concept helps us to derive relationships between physical quantities. Dimensional analysis is the study of the relation between physical quantities based on their units and dimensions. It is used to convert a unit from one form to another. While solving mathematical problems, it is necessary to keep the units the same to solve the problem easily.</p> <p>i) What are dimensionless quantities? (1)</p> <p>ii) Who introduced Dimensional Analysis? (1)</p> <p>iii) What are dimensional variables? Give any two examples (2)</p> <p style="text-align: center;">OR</p> <p>Check the correctness of the following relation using dimensional analysis.</p> <p>a) $S = ut + 1/2at^2$ b) $v^2 - u^2 = 2as$.</p>	4
Section - E		
In case of internal choices, attempt any one of them.		
10	<p>A man walks on a straight road from his home to a market 2.5 km away with a speed of 5 km h^{-1} Finding the market closed, he instantly turns and walks back home with a speed of 7.5 km h^{-1} What is the (a) Magnitude of average velocity, and (b) Average speed of the man over the interval of time (i) 0 to 30 min, (ii) 0 to 50 min, (iii) 0 to 40 min.</p> <p style="text-align: center;">OR</p> <p>The figure below shows the position-time graph of a body moving along a straight line.</p> <div style="text-align: center;"> </div> <p>i) Draw the velocity-time graph of the body.</p> <p>ii) From the graph, find the displacement in 20 seconds.</p> <p>iii) Also write the two differences between distance and displacement.</p>	5

	and refractive index, has some dimensions.	
6	Assertion(A): The v-t graph perpendicular to time axis is not possible in practice. Reason(R): Infinite acceleration cannot be realized in practice.	1
Section-B		
7	A bullet moving with a velocity of 10 m/s hits the wooden plank, the bullet is stopped when it penetrates the plank 20 cm deep. Calculate retardation of the bullet.	2
Section-C		
8	The frequency of vibration (n) of a string depends upon length (l) of the string, tension/force (T) of the string and mass per unit length (m) of the string. Using the method of dimension, derive a formula for the frequency of vibration of the string.	3
Section-D (CASE STUDY)		
9	To solve the mathematical problems of physical quantities, it is important to have a brief knowledge of units and dimensions. The basic concept of dimensions is that only those quantities can be added or subtracted which have the same dimension. This concept helps us to derive relationships between physical quantities. Dimensional analysis is the study of the relation between physical quantities based on their units and dimensions. It is used to convert a unit from one form to another. While solving mathematical problems, it is necessary to keep the units the same to solve the problem easily. i) What are dimensionless quantities? (1) ii) Who introduced Dimensional Analysis? (1) iii) What are dimensional variables? Give any two examples (2) OR Check the correctness of the following relation using dimensional analysis. a) $S = ut + \frac{1}{2}at^2$ b) $v^2 - u^2 = 2as$.	4
Section-E In case of internal choices, attempt any one of them.		
10	A man walks on a straight road from his home to a market 2.5 km away with a speed of 5 km h ⁻¹ Finding the market closed, he instantly turns and walks back home with a speed of 7.5 km h ⁻¹ What is the (a) Magnitude of average velocity, and (b) Average speed of the man over the interval of time (i) 0 to 30 min, (ii) 0 to 50 min, (iii) 0 to 40 min. OR The figure below shows the position-time graph of a body moving along a straight line.  i) Draw the velocity-time graph of the body. ii) From the graph, find the displacement in 20 seconds. iii) Also write the two differences between distance and displacement.	5

