1M

1. A train travels 40 km at a uniform speed of $30 \mathrm{~km} \mathrm{~h}^{-1}$. Its average speed after travelling another 40 km is $45 \mathrm{~km} \mathrm{~h}^{-1}$ for the whole journey. Its speed in the second half of the journey is
(A) $45 \mathrm{~km} \mathrm{~h}^{-1}$
(B) $90 \mathrm{~km} \mathrm{~h}^{-1}$
(C) $60 \mathrm{~km} \mathrm{~h}^{-1}$
(D) None of these

1M
2.


In the above velocity-time graph of a moving object
(A) Acceleration in the first 2 seconds is $2.3 \mathrm{~ms}^{-1}$
(B) Acceleration in the last 2 seconds is $-2.3 \mathrm{~ms}^{-1}$
(C) Motion is uniform between second and tenth second
(D) All are correct

1M
3. In the given velocity-time graph $A B$ shows that the body has

(A) Uniform acceleration
(B) Uniform deceleration
(C) Uniform velocity throughout the motion
(D) None of these

1M
4. In the adjoining velocity-time graph

(A) Velocity is decreasing with time
(B) Deceleration is uniform
(C) The object has a negative velocity beyond the point $B$
(D) All are correct

1M
5. A train starting from rest attains the velocity of $72 \mathrm{~km} \mathrm{~h}^{-1}$. If the train has taken 5 minutes, it would have travelled a distance of
(A) 15 km
(B) 3 km
(C) 6 km
(D) None of these

1M
6. An object has travelled 10 km in 15 minutes, its displacement will be
(A) 10 km
(B) Can be zero
(C) More than 10 km
(D) Cannot be predicted

1M
7. Define Centripetal force.

1M
8. When do we say the acceleration of a body is zero?
9. What is meant by non-uniform acceleration?

1M
10. What is meant by uniform acceleration?

1M
11. Define acceleration?

1M
12. When does the velocity and speed of a moving body become identical?

1M
13. What is meant by average velocity of a body moving in a particular direction?

1M
14. When does the velocity change?

1M
15. What is meant by the displacement?

1M
16. What is meant by the term distance?

1M
17. What is a scalar quantity?

1M
18. How is the position of an object described?

1M
19. What is meant by body in motion?

1M
20. What is meant by body at rest?

1M
21. Why is uniform linear motion not an accelerated motion?

1M
22. A moving train is brought to rest within 20 sec by applying brakes. Find the initial velocity, if the retardation due to brakes is $2 \mathrm{~m} / \mathrm{s}^{2}$.

1M
23. What is positive acceleration and negative acceleration?

1M
24. What is meant by non-uniform velocity?

1M
25. What is meant by uniform velocity (constant velocity)?

1M
26. Define velocity?

1M
27. What is non-uniform motion?

1M
28. What is uniform motion?

1M
29. What is a vector quantity?

1M
30. A jeep starts from rest and attains a speed of $40 \mathrm{~km} \mathrm{~h}^{-1}$ in 10 minutes. The uniform acceleration will be
(A) $4 \mathrm{~km} \mathrm{~h}^{-1}$
(B) $4 \mathrm{~km} \mathrm{~m}^{-1}$
(C) $66.7 \mathrm{~m} \mathrm{~s}^{-2}$
(D) $66.7 \mathrm{~m} \mathrm{~s}^{-1}$

1M
31. Displacement is the
(A) Shortest distance between initial and final positions
(B) The actual distance between initial and final positions
(C) The distance travelled by the object
(D) Distance travelled by the object in a unit time

1M
32.


This time-displacement graph shows
(A) An object moving with a uniform velocity
(B) An object moving with a non-uniform speed
(C) A uniformly accelerated motion
(D) No information

1M
33. Motion of an object is the change in position with respect to a reference point, also known as
(A) Origin
(B) Initial position
(C) Final position
(D) Distance

1M
34. If an object covers equal distances in equal intervals of time, it is said to be in
(A) Circular Motion
(B) Uniform Motion
(C) Oscillatory Motion
(D) Non-uniform Motion

1M
35. Average speed of an object is obtained by
(A) Dividing the total distance travelled by the total time taken
(B) Half of the sum of the initial speed and the final speed
(C) Both (1) and (2)
(D) Multiplying total distance with the total time.

1M
36. S.I. Unit of speed is metre per second. Other units of speed are
(A) $\mathrm{km} \mathrm{h}^{-1}$
(B) $\mathrm{cm} \mathrm{s}^{-1}$
(C) $\mathrm{h} \mathrm{Km}^{-1}$
(D) Only (1) and (2)

1M
37. Speed is a
(A) Scalar quantity
(B) Vector quantity
(C) Fixed quantity
(D) Unequal quantity

1M
38. Velocity is the speed of an object moving
(A) In a definite direction
(B) In any direction
(C) In circular direction
(D) Reverse direction

1M
39. Average velocity of an object is obtained by
(A) Dividing the total distance travelled by the total time taken
(B) Half of the sum of the initial velocity and the final velocity
(C) Both (1) and (2)
(D) None of the above

1M
40. Magnitude of average speed of an object is equal to its average velocity if
(A) It is moving in a definite direction
(B) Its initial and final positions are same
(C) It is a uniform motion
(D) None of these

1M
41. Acceleration of an object is
(A) The change in velocity per unit time
(B) A vector quantity
(C) In the direction of velocity
(D) All of the above

1M
42. Negative value of acceleration signifies
(A) The velocity is increasing
(B) The velocity is decreasing
(C) The velocity remains the same
(D) The object comes to rest

1M
43. In distance-time graphs
(A) Distance is taken along the X - axis
(B) Time is taken along the $Y$-axis
(C) Straight line indicates uniform motion
(D) Straight line indicates non-uniform motion

1M
44. In velocity-time graphs
(A) Velocity is taken along the Y -axis and time is taken along the X -axis
(B) Straight line indicates uniform acceleration
(C) Straight line parallel to x -axis indicates uniform motion
(D) All of the above

1M
45. In the velocity-time graphs, the distance is given by
(A) The area enclosed by the velocity-time graph and $x$-axis
(B) The length of the graph line
(C) The slope of the line
(D) None of these

1M
46. The equations of motion can be represented as
(A) $v=u+a t$
(B) $s=u t+1 / 2 a t^{2}$
(C) $2 a s=v^{2}-u^{2}$
(D) All of these

1M
47. Motion of a satellite in circular orbit is an example of
(A) Uniform circular motion
(B) Accelerated circular motion
(C) Non-uniform circular motion
(D) Linear motion

1M
48. Average speed of a car is $50 \mathrm{~km} \mathrm{~h}^{-1}$. It can also be expressed in S.I. Units as
(A) $13.9 \mathrm{~m} \mathrm{~s}^{-1}$
(B) $5 \mathrm{~m} \mathrm{~s}^{-1}$
(C) $50 \mathrm{~m} \mathrm{~s}^{-1}$
(D) $139 \mathrm{~m} \mathrm{~s}^{-1}$

1M
49. A man moved 6 m in south and then turned towards east to move 8 m . What is the distance travelled by the man and the displacement of the man?
(A) Distance $=6 \mathrm{~m}$, Displacement $=8 \mathrm{~m}$
(B) Distance $=14 \mathrm{~m}$, Displacement $=8 \mathrm{~m}$
(C) Distance $=14 \mathrm{~m}$, Displacement $=10 \mathrm{~m}$
(D) Distance= 14 m , Displacement= 14 m

1M
50. Study the following table:

| Distance | Time taken |
| :--- | :--- |
| 10 Km | 2 hr |
| 25 Km | 4 hr |
| 60 Km | 6 hr |

What type of motion is exhibited by the body?
(A) Uniform motion
(B) Non-uniform motion
(C) Uniformly accelerated motion
(D) Non-uniformly accelerated motion
51. Convert $\mathrm{Km} / \mathrm{h}^{2}$ into $\mathrm{m} / \mathrm{s}^{2}$ :
(A) $5 / 18$
(B) $5 / 36$
(C) $5 / 54$
(D) 5/324

1M
52. Which physical quantity varies in a uniform circular motion?
(A) Speed
(B) Velocity
(C) Acceleration
(D) Both velocity and acceleration

1M
53. Two cars A and B covered 40 Km and 60 Km in 2 hours and 3 hours respectively. Which of the following is moving faster?
(A) Car A
(B) Car B
(C) Both are moving with same velocity
(D) Cannot be predicted from the given data

1M
54. The value of acceleration if velocity-time graph is a straight line parallel to time axis is:
(A) Infinity
(B) Zero
(C) One
(D) Cannot be predicted

1M
55. Which of the following situation/situations is/are not possible?
(i) Velocity-time graph with a line parallel to velocity axis.
(ii) Velocity-time graph with downward slope.
(iii) Distance-time graph with a line parallel to time axis.
(A) Statement (i) only
(B) Statement (ii) only
(C) Both statements (i) and (ii)
(D) Statements (ii) and (iii)

1M
56. Area under velocity time graph indicates:
(A) Magnitude of displacement
(B) Magnitude of acceleration
(C) Both magnitude and direction of displacement
(D) Both magnitude and direction of acceleration

2M
57. What is meant by angular acceleration?

2M
58. What is meant by angular velocity? Write its unit.

2M
59. Why is the motion of Satellites around their planets considered an accelerated motion?

2M
60. A racing car has a uniform acceleration of $4 \mathrm{~ms}^{-2}$. What distance will it cover in 10 seconds after the start?

2M
61. A bus covers a distance of 250 km from Delhi to Jaipur towards West in 5 hours in the morning and returns to Delhi in the evening covering the same distance of 250 km in the same time of 5 hours. Find (a) average speed \& (b) average velocity of the bus for the whole journey.

2M
62. A car travels a distance of 200 km from Delhi to Ambala towards North in 5 hours. Calculate (i) Speed \& (ii) Velocity of car for this journey?<

2M
63. What are equations of motion?

2M
64. A body thrown vertically upward rises up to a height $H$, and comes back to the initial position.
i) Calculate the total distance travelled by the body
ii) The displacement of the body
65. The train A travelled a distance of 120 km in 3 hours where as another train $B$ travelled a distance of 180 Km in 4 hours. Which train travelled faster.

2M
66. Explain the uniform and non uniform motion by distance time graph.

2M
67. Convert a speed of $72 \mathrm{~km} / \mathrm{hr}$ into
a) $\mathrm{m} / \mathrm{s}$ b) $\mathrm{cm} / \mathrm{s}$

2M
68. What are the characteristics of scalar quantities?

## 2M

69. A train starting from rest attains a velocity of $72 \mathrm{~km} \mathrm{~h}^{-1}$ in 5 min . Assuming that the acceleration is uniform; find
(i) The acceleration.
(ii) The distance travelled by the train for attaining this velocity.

2M
70. A cyclist goes around a circular track once every 2 minutes. If the radius of the circular track is 105 metres, calculate his speed.
(Given

$$
\pi=22 / 7)
$$

2M
71. Why is uniform circular motion called accelerated motion?

## 2M

72. A scooter moving at a speed of $10 \mathrm{~m} / \mathrm{s}$ is stopped by applying brakes which produce a uniform acceleration of $-0.5 \mathrm{~ms}^{-2}$. How much distance will be covered by the scooter before it stops?

2M
73. A driver change the speed of car from $25 \mathrm{~m} / \mathrm{s}$ to $10 \mathrm{~m} / \mathrm{s}$ in 5 seconds. Find the acceleration of the car.

2M
74. The average speed of a bicycle, an athlete and a car are $18 \mathrm{~km} / \mathrm{hr}, 7 \mathrm{~m} / \mathrm{s}$ and $2 \mathrm{~km} / \mathrm{min}$ respectively. Which of these is the fastest and which of these is slowest?

2M
75. What are the characteristics of displacement?

2M
76. What are the characteristics of vector quantities?

3M
77. The brakes applied to a car produced an acceleration of $6 \mathrm{~ms}^{-2}$ in the opposite direction of the motion. If the car takes 2 s to stop after the application of brakes, calculate the distance it travels during this time.

3M
78. A scooter acquires a velocity of 36 km per hour in 10 seconds just after the start. Calculate the acceleration of the scooter.

3M
79. Consider the situation shown in fig. below:
a) What is the position of a particle when it is at $P_{1}$ and when it is at $P_{2}$.
b) Are the positions same?
c) Are the two distance of the particle from the origin same?


3M
80. A car covers 30 km at a uniform speed of $60 \mathrm{~km} / \mathrm{h}$ and the next $30 \mathrm{~km} / \mathrm{h}$ at a uniform speed of $40 \mathrm{~km} / \mathrm{h}$. find the total time taken.

3M
81. A bus between Vishakhapatnam and Hyderabad passed the 100 km ,

160 km and 220 km points at 10.30 a.m., 11.30 a.m. and 1.30. p.m.
Find the average speed of the bus during each of the following intervals.

3M
82. A train travels at a speed of $60 \mathrm{~km} / \mathrm{hr}$ for $0.52 / \mathrm{hr}$, at $30 \mathrm{~km} / \mathrm{h}$ for the next 0.24 hr and then at $70 \mathrm{~km} / \mathrm{h}$ for the next 0.71 h . What is the average speed of the train?

3M
83.

A man travels a distance of 1.5 m towards East, then 2.0 m towards South and finally 4.5 m towards East.
i) What is the total distance traveled?
ii) What is his total displacement?

3M
84. Define the following
a).Speed.
b).Average speed.
c).Uniform speed.

3M
85. A particle is moving in a circle of radius 1 m . Show the following position of the particle:
a) 1 m . from the center, $30^{\circ}$ North-East.
b) 1 m . from the center, $30^{\circ}$ West-North.
c) 1 m . from the center towards South.

3M
86. Differentiate between:-
a) Speed and average speed
b) Speed and velocity
c) Uniform linear motion and uniform circular motion

## 5M

87. How many different types of velocity-time (speed-time) graphs are possible for a straight-line motion.

5M
88. Explain using distance - time graphs:
a) When the body is at rest.
b)When the body is moving with a uniform speed
c) When the body is moving with a non-uniform speed.

5M
89. Write the mathematical expression \& S.I. units of the following?

1. Speed
2. Average velocity
3.Velocity
3. Average Velocity
4. Acceleration

1M
90. A body falls freely. What is constant

1M
91. A body starts from rest. What is zero ?

1M
92. A body stops after some time. What is zero ?

1M
93. Displacement of a body is 3 metre when distance travelled by it is 2 metre. Can it be true ?

1M
94. Can a body have acceleration when its velocity is zero ?

1M
95. A body moving with uniform speed may have variable velocity. Exemplify.

1M
96. What is the nature of displacement time graph of a body moving uniformly along a straight line?

1M
97. How do you calculate velocity of a body from its displacement time graph ?

1M
98. The displacement time graph of a body is parallel to time axis. What does it signify ?

1M
99. The displacement time graph of a body is parallel to displacement axis. Is it true ?
100. What is represented by slope of velocity time graph ?

1M
101. Velocity time graph of a body is parallel to time axis. What is acceleration of the body ?
102. What is nature of velocity time graph of a body moving with uniform retardation ?
103. Displacement can be zero when distance travelled is not zero. But when distance travelled is zero, displacement must be zero. Justify.

2M
104. A particle is travelling in a circle of diameter 15 metre. Calculate the distance covered and the displacement when it completes two rounds.

2M
105. The speed of a car increases from $18 \mathrm{~km} / \mathrm{h}$ to $36 \mathrm{~km} / \mathrm{h}$ in 10 second. What is its acceleration?

2M
106. Draw velocity time graph of a body moving with uniform acceleration
uniform retardation.

2M
107. Draw velocity time graph of a train starting from Ambala and stopping at Delhi, under ideal conditions.

3M
108. Using velocity time graph of uniformly accelerated motion along a straight line, derive the equation for position-velocity relation,

## 3M

109. A body is moving along a straight line with a uniform acceleration. Draw velocity time graph of this body and obtain the equation for velocity time relation.

## 3M

110. A passenger lift starts from rest accelerates uniformly and attains a speed of $4-6 \mathrm{~m} / \mathrm{s}$ in 2 seconds. This speed is maintained for next 6 seconds. Then, the lift undergoes uniform retardation and stops in the next 2 seconds. Draw velocity time graph of the lift and calculate the total distance covered by the lift in 12 seconds.

3M
111. A scooter acquires a velocity of $36 \mathrm{~km} / \mathrm{h}$ in 10 second after start, and it takes 20 seconds to stop. Calculate acceleration and distance travelled in the two cases.

## 5M

112. Draw position time graph of a body
(0 at rest
(«) in uniform motion
(Hi) in uniformly accelerated motion. Explain the curves obtained.

5M
113. Draw speed time graph of a body
(0 at rest
(it) in uniform motion
(HI) in uniformly accelerated motion
(iv) in uniformly retarded motion.

Explain the curves obtained.

5M
114. Explain what is meant by uniform circular motion. Give atleast two examples of this kind of motion.

