Yakeen NEET 2.0 (2026)

Physics by Saleem Sir

KPP -15(Part 02) **Kinematics**

Is KPP me saare question one liner solution within 1 mint me solve hone wale ques hain....jesa phle neet me ques aate the...improve ur speed and accuracy.

Distance and displacement

1. A man goes 10m towards north, then 20 m towards east then displacement is

[KCET 1999; JIPMER 1999; AFMC 2003]

(1) 22.5 m (2) 25 m

(3) 25.5 m (4) 30 m

2. A person moves 30 m north and then 20 m towards east and finally $30\sqrt{2}$ m in south-west direction. The displacement of the person from the origin will be

[J & K CET 2004]

(1) 10 m along north

(2) 10 m long south

(3) 10 m along west

(4) Zero

3. An aeroplane flies 400 m north and 300 m south and then flies 1200 m upwards then net displacement is

[AFMC 2004]

(1) 1200 m

(2) 1300 m

(3) 1400 m

(4) 1500 m

4. An athlete completes one round of a circular track of radius R in 40 sec. What will be his displacement at the end of 2 min. 20 sec

[NCERT 1990; Kerala PMT 2004]

(1) Zero

(2) 2R

(3) 2 πR

(4) 7 πR

5. A graph is drawn between velocity and time for the motion of a partice. The area under the curve between the time intervals t_1, and t_2 gives

[Kerala PMT 2010, 11]

(1) Momentum of the particle

(2) Displacement of the particle

(3) Acceleration of the particle

(4) Change in velocity of the partice

(5) Force on the particle

6. A wheel of radius 1 m rolls forward half a revolution on a horizontal ground. The magnitude of the displacement of the point of the wheel initially in contact with the ground is

[BCECE 2005]

(1) 2 π (2) $\sqrt{2}\pi$

(3) $\sqrt{\pi^2+4}$ (4) π

7. An automobile travelling with a speed of 60 km/h, can brake to stop within a distance of 20 m. If the car is going twice as fast, i.e., 120 km/h, the stopping distance will be

[AIEEE 2004]

(1) 20 m (2) 40 m

(3) 60 m (4) 80 m

8. Stopping distance of a moving vehicle is directly proportional to

[Kerala PMT 2010]

(1) Square of the initial velocity

(2) Square of the initial acceleration

(3) The initial velocity

(4) The initial acceleration

(5) Mass of the vehicle

9. The initial and final position vectors for a particle are respectively $(-3.0\text{m})\hat{i}+(2.0\text{m})\hat{j}+(8.0\text{m})\hat{k}$ and $(9.0\text{m})\hat{i}+(2.0\text{m})\hat{j}+(-8.0\text{m})\hat{k}$. The displacement of the particle is

[MP PET 2010]

(1) $(6.0\text{m})\hat{i}+(4.0\text{m})\hat{j}+(16.0\text{m})\hat{k}$

(2) $(6.0\text{m})\hat{i}$

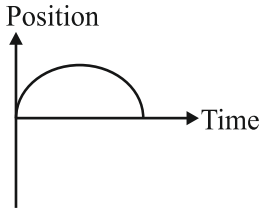
(3) $(12.0\text{m})\hat{i}-(16.0\text{m})\hat{k}$

(4) $(12.0\text{m})\hat{i}$

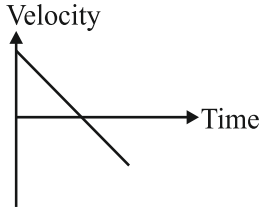
10. All the graphs below are intended to represent the same motion. One of them does it incorrectly. Pick it up.

[JEE (Main) 2018]

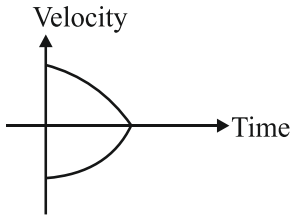
(1)



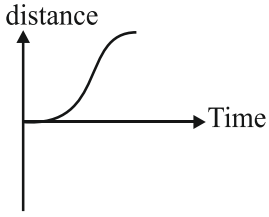
(2)



(3)

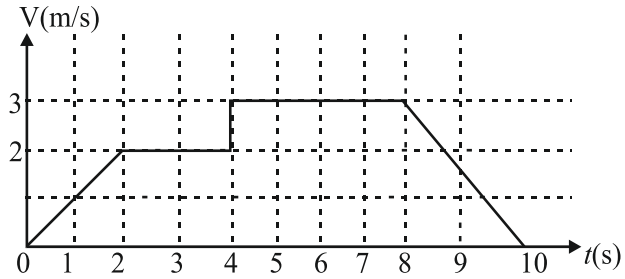


(4)



11. A partide starts from origin at time t = 0 and moves along the positive x-axis. The graph of velocity with respect to time is shown in figure. What is the position of the particle at time t = 5s.

[JEE (Main) 2019]



(1) 6m (2) 9m

(3) 3m (4) 16m

Uniform motion

12. A body is moving along a straight line path with constant velocity. At an instant of time the distance travelled by it is S and its displacement is D, then

[J & K CET 2008]

(1) D < S

(2) D > S

(3) D = S

(4) D ≤ S

13. The displacement-time graph for two particles A and B are straight lines inclined at angles of 30° and 60° with the time axis. The ratio of velocities of $V_A : V_B$ is

[CPMT 1990; MP PET 1999, 2001; Pb. PET 2003]

(1) 1 : 2 (2) $1:\sqrt{3}$

(3) $\sqrt{3}:1$ (4) 1 : 3

14. The numerical ratio of displacement to the distance covered is always

[BHU 2004]

(1) Less than one

(2) Equal to one

(3) Equal to or less than one

(4) Equal to or greater than one

15. The ratio of the numerical values of the average velocity and average speed of a body is always

[MP PET 2002]

(1) Unity

(2) Unity or less

(3) Unity or more

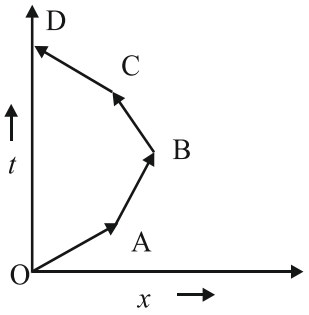
(4) Less than unity

16. Which of the following is a one dimensional motion
[BHU 2000; CBSE PMT 2001]
(1) Landing of an aircraft
(2) Earth revolving around the sun
(3) Motion of wheels of moving train
(4) Train running on a straight track

17. A 150 m long train is moving with a uniform velocity of 45 km/h. The time taken by the train to cross a bridge of length 850 m is
[CBSE PMT 2001; Similar BHU 2004]
(1) 56 sec (2) 68 sec
(3) 80 sec (4) 92 sec

18. A particle is constrained to move on a straight line path. It returns to the starting point after 10 sec. The total distance covered by the particle during this time is 30 m. Which of the following statements about the motion of the particle is false
[CBSE PMT 2000; AFMC 2001]
(1) Displacement of the particle is zero
(2) Average speed of the particle is 3 m/s
(3) Displacement of the particle is 30 m
(4) Both (1) and (2)

19. Which of the following options is correct for the object having a straight line motion represented by the following graph
[DCE 2004]



(1) The object moves with constantly increasing velocity from O to A and then it moves with constant velocity.
(2) Velocity of the object increases uniformly
(3) Average velocity is zero
(4) The graph shown is impossible

20. A person travels along a straight road for the first half time with a velocity v_1 and the next half time with a velocity v_2. The mean velocity V of the man is
[RPET 1999; Similar RPET 1996; BHU 2002; MP PET 2009]
(1) $\frac{2}{V}=\frac{1}{v_1}+\frac{1}{v_2}$ (2) $V=\frac{v_1+v_2}{2}$
(3) $V=\sqrt{v_1v_2}$ (4) $V=\sqrt{\frac{v_1}{v_2}}$

21. A particle moves along a semicircle of radius 10 m in 5 seconds. The average velocity of the particle is
[Kerala (Engg.) 2001]
(1) 2π ms^{-1} (2) 4π ms^{-1}
(3) 2 ms^{-1} (4) 4 ms^{-1}

22. A man walks on a straight road from his home to a market 2.5 km away with a speed of 5 km/h. Finding the market closed, he instantly turns and walks back home with a speed of 7.5 km/h. The average speed of the man over the interval of time 0 to 40 min. is equal to
[AMU (Med.) 2002]
(1) 5 km/h (2) $\frac{25}{4}$ km/h
(3) $\frac{30}{4}$ km/h (4) $\frac{45}{8}$ km/h

23. A particle moves for 20 seconds with velocity 3 m/s and then velocity 4 m/s for another 20 seconds and finally moves with velocity 5 m/s for next 20 seconds. What is the average velocity of the particle
[MH CET 2004]
(1) 3 m/s (2) 4 m/s
(3) 5 m/s (4) Zero

24. A train has a speed of 60 km/h for the first one hour and 40 km/h for the next half hour. Its average speed in km/h is
[JIPMER 1999]
(1) 50
(2) 53.33
(3) 48
(4) 70

25. A cat moves from X to Y with a uniform speed v_u, an returns to X with a uniform speed v_d. The average speed for this round trip is

[Similar MP PMT 2001; CBSE PMT 2007]

(1) $\frac{2v_dv_u}{v_d+v_u}$ (2) $\sqrt{v_uv_d}$

(3) $\frac{v_dv_u}{v_d+v_u}$ (4) $\frac{v_u+v_d}{2}$

26. One car moving on a straight road covers one third of the distance with 20 km/hr and the rest with 60 km/hr. The average speed is:

[MP PMTT 1999; CPMT 2002; Kerala PET 2010]

(1) 40 km/hr

(2) 80 km/hr

(3) $46\frac{2}{3}$ km/hr

(4) 36 km/hr

27. A car moves a distance of 200 m. It covers first half of the distance at speed 60 kmh^{-1} and the second half at speed v. If the average speed is 40 kmh^{-1}, the value of u is:

[Kerala PET 2011]

(1) 30 kmh^{-1} (2) 13 kmh^{-1}

(3) 60 kmh^{-1} (4) 40 kmh^{-1}

(5) 20 kmh^{-1}

28. Select the incorrect statements from the following

S1 : Average velocity is path length divided by time interval

S2: In general, speed is greater than the magnitude of the velocity

S3: A particle moving in a given direction with a non-zero velocity can have zero speed

S4: The magnitude of average velocity is the average speed

[AMU (Med.) 2010]

(1) S2 and S3 (2) S1 and S4

(3) S1, S3 and S4 (4) All four statements

Non-uniform Motion

29. A particle starts its motion from rest under the action of a constant force. If the distance covered in first 10 seconds is S_1 and that covered in the first 20 seconds is S_2, then

[CBSE PMT 2009; MP PET 2011; Similar KCET 2012]

(1) $S_2 = 2S_1$ (2) $S_2 = 3S_1$

(3) $S_2 = 4\ S_1$ (4) $S_2 = S_1$

30. A particle moves in a straight line with a constant acceleration. It changes its velocity from 10 ms^{-1} to 20 ms^{-1} while passing through a distance 135 m in t second. The value of t is:

[CBSE PMT 2008]

(1) 12 (2) 9

(3) 10 (4) 1.8

31. A bullet emerges from a barrel of length 1.2 m with a speed of 640 ms^{-1}. Assuming constant acceleration, the approximate time that it spends in the barrel after the gun is fired is:

[WB-JEE 2008]

(1) 4 ms (2) 40 ms

(3) 400 μs (4) 1 s

32. A car starts from rest and accelerates uniformly to a speed of 180 kmh^{-1} in 10 seconds. The distance covered by the car in this time interval is:

[Kerala PMT 2009]

(1) 500 m (2) 250 m

(3) 100 m (4) 200 m

(5) 150 m

33. The initial velocity of a particle is u (at $t = 0$) and the acceleration f is given by at. Which of the following relation is valid.

[CPMT 1981; BHU 1995]

(1) $v = u + at^2$ (2) $v = u + a\frac{t^2}{2}$

(3) $v = u + at$ (4) $v = u$

34. What determines the nature of the path followed by the particle.

[AFMC 2005]

(1) Speed (2) Velocity

(3) Acceleration (4) Both (2) and (3)

35. A car moving with a speed of 40 km/h can be stopped by applying brakes after at least 2m. If the same car is moving with a speed of 80 km/h, what is the minimum stopping distance.
[CBSE PMT 1998, 99; AFMC 2000; JIPMER 2001, 02; Similar AIEEE 2003, 04]
(1) 8 m (2) 2 m
(3) 4 m (4) 6 m

36. Speed of two identical cars are u and $4u$ at a specific instant. The ratio of the respective distances in which the two cars are stopped from that instant is:
[AIEEE 2002]
(1) 1 : 1 (2) 1 : 4
(3) 1 : 8 (4) 1 : 16

37. A body moves from rest with a constant acceleration of 5 m/s^2. Its instantaneous speed (in m/s) at the end of 10 sec is:
[Similar EAMCET 1982; SCRA 1994]
(1) 50 (2) 5
(3) 2 (4) 0.5

38. If a car at rest accelerates uniformly to a speed of 144 km/h in 20 s. Then it covers a distance of
[CBSE PMT 1997]
(1) 20 m (2) 400 m
(3) 1440 m (4) 2880 m

39. If a train travelling at 72 kmph is to be brought to rest in a distance of 200 metres, then its retardation should be:
[Similar EAMCET 1979; SCRA 1998; MP PMT 2004]
(1) 20 ms^{-2} (2) 10 ms^{-2}
(3) 2 ms^{-2} (4) 1 ms^{-2}

40. Two cars A and B at rest at same point initially. If A starts with uniform velocity of 40 m/sec and B starts in the same direction with constant acceleration of 4 m/s^2, then B will catch A after how much time
[RPET 1999]
(1) 10 sec (2) 20 sec
(3) 30 sec (4) 35 sec

41. Acceleration of a particle changes when
[RPMT 2000]
(1) Direction of velocity changes
(2) Magnitude of velocity changes
(3) Both of above
(4) Speed changes

42. A bullet moving with a velocity of 200 cm/s penetrates a wooden block and comes to rest after traversing 4 cm inside it. What velocity is needed for travelling distance of 9 cm in same block.
(1) 100 cm/s (2) 136.2 cm/s
(3) 300 cm/s (4) 250 cm/s

43. The position of a particle moving along the x-axis at certain times is given below:

t(s)	0	1	2	3
x(m)	–2	0	6	16

Which of the following describes the motion correctly
[AMU (Engg.) 2001]
(1) Uniform, accelerated
(2) Uniform, decelerated
(3) Non-uniform, accelerated
(4) There is not enough data for generalization

44. Consider the acceleration, velocity and displacement of a tennis ball as it falls to the ground and bounces back, Directions of which of these changes in the process.
[AMU (Engg.) 2001]
(1) Velocity only
(2) Displacement and velocity
(3) Acceleration, velocity and displacement
(4) Displacement and acceleration

45. A body is moving with uniform acceleration describes 40 m in the first 5 sec and 65 m in next 5 sec . Its initial velocity will be:
[Pb. PET 2003]
(1) 4 m/s (2) 2.5 m/s
(3) 5.5 m/s (4) 11 m/s

46. The velocity of a bullet is reduced from 200 m/s to 100 m/s while travelling through a wooden block of thickness 10 cm. The retardation, assuming it to be uniform, will be:
[AIIMS 2001; RPMT 2006]
(1) 10×10^4 m/s^2
(2) 12×10^4 m/s^2
(3) 13.5×10^4 m/s^2
(4) 15×10^4 m/s^2

47. An object accelerates from rest to a velocity 27.5 m/s in 10 sec then find the distance covered by the object in next 10 sec.

[BCECE 2004]

(1) 550 m (2) 137.5 m
(3) 412.5 m (4) 275 m

48. A body moves with initial velocity 10 ms^{-1}. If it covers a distance of 20 m in 2 s, then acceleration of the body is:

[Odisha JEE 2011]

(1) Zero (2) 10 ms^{-2}
(3) 5 ms^{-2} (4) 2 ms^{-2}

49. If a particle moves with an acceleration, then which of the following can remain constant

[J & K CET 2012]

(1) Both speed and velocity
(2) Neither speed nor velocity
(3) Only the velocity
(4) Only the speed

50. A boggy of uniformly moving train is suddenly detached from train and stops after covering some distance. The distance covered by the boggy and distance covered by the train in the same time has relation

[RPET 1997]

(1) Both will be equal
(2) First will be half of second
(3) First will be 1/4 of second
(4) No definite ratio

51. A body travels for 15 sec starting from rest with constant acceleration. If it travels distances S_1, S_2 and S_3 in the first five seconds, second five seconds and next five seconds respectively the relation between S_1, S_2 and S_3 is:

[AMU (Engg.) 2000]

(1) $S_1 = S_2 = S_3$
(2) $5S_1 = 3S_2 = S_3$
(3) $S_1 = \frac{1}{3}S_2 = \frac{1}{5}S_3$
(4) $S_1 = \frac{1}{5}S_2 = \frac{1}{3}S_3$

52. A particle travels 10 m in first 5 sec and 10 m in next 3 sec. Assuming constant acceleration what is the distance travelled in next 2 sec.

[RPET 2000]

(1) 8.3 m
(2) 9.3 m
(3) 10.3 m
(4) None of above

53. A particle has an initial velocity of $3\hat{i} + 4\hat{j}$ and an acceleration of $0.4\hat{i} + 0.3\hat{j}$. Its speed after 10 s is:

[AIEEE 2009; CBSE PMT 2010]

(1) 10 units (2) $7\sqrt{2}$ units
(3) 7 units (4) 8.5 units

54. The distance travelled by a particle starting from rest and moving with an acceleration $\frac{4}{3}ms^{-2}$, in the third second is:

[Similar MP PMT 1996; CBSE PMT 2008]

(1) $\frac{10}{3}$m (2) $\frac{19}{3}$m
(3) 6 m (4) 4 m

55. A body starting from rest moves with constant acceleration. The ratio of distance covered by the body during the 5th sec to that covered in 5 sec is:

[Kerala PET 2005]

(1) 9/25 (2) 3/5
(3) 25/9 (4) 1/25

56. If a ball is thrown vertically upwards with speed *u*, the distance covered during the last *t* seconds of its ascent is:

[CBSE PMT 2003]

(1) $\frac{1}{2}gt^2$ (2) $ut - \frac{1}{2}gt^2$
(3) $(u - gt)t$ (4) ut

57. A small block slides without friction down an inclined plane starting from rest. Let S_n be the distance travelled from time $t = n - 1$ to $t = n$. Then $\frac{S_n}{S_{n+1}}$ is:

[IIT-JEE (Screening) 2004]

(1) $\frac{2n-1}{2n}$ (2) $\frac{2n+1}{2n-1}$
(3) $\frac{2n-1}{2n+1}$ (4) $\frac{2n}{2n+1}$

58. The initial velocity of a body moving along a straight line is 7 m/s. It has a uniform acceleration of 4 m/s^2. The distance covered by the body in the 5th second of its motion is:

[Similar CPMT 1976; MP PMT 1994]

(1) 25 m (2) 35 m
(3) 50 m (4) 85 m

59. A body starts from rest. What is the ratio of the distance travelled by the body during the 4th and 3rd second.

[CBSE PMT 1993; MP PET 2007]

(1) 7/5 (2) 5/7
(3) 7/3 (4) 3/7

60. If a body starts from rest and travels 120 cm in the 6th second, then what is the acceleration.

[AFMC 1997]

(1) 0.20 m/s^2 (2) 0.027 m/s^2
(3) 0.218 m/s^2 (4) 0.03 m/s^2

61. A body A starts from rest with an acceleration a_1. After 2 seconds, another body B starts from rest with an acceleration a_2. If they travel equal distances in the 5th second, after the start of A, then the ratio $a_1 : a_2$ is equal to:

[AIIMS 2001]

(1) 5 : 9 (2) 5 : 7
(3) 9 : 5 (4) 9 : 7

62. A particle starts from rest, accelerates at 2 m/s^2 for 10 s and then goes with constant speed for 30 s and then decelerates at 4 m/s^2 till it stops. What is the distance travelled by it.

[DCE 2001; AIIMS 2002; DCE 2003]

(1) 750 m
(2) 800 m
(3) 700 m
(4) 850 m

63. A car starts from rest and moves with uniform acceleration a on a straight road from time $t = 0$ to $t = T$. After that, a constant deceleration brings it to rest. In this process the average speed of the car is:

[MP PMT 2004]

(1) $\frac{aT}{4}$ (2) $\frac{3aT}{2}$
(3) $\frac{aT}{2}$ (4) aT

64. A car, starting from rest, accelerates at the rate f through a distance S, then continues at constant speed for time t and then decelerates at the rate $\frac{f}{2}$ to come to rest. If the total distance traversed is 15 S, then

[AIEEE 2005; AIIMS 2008]

(1) $S = \frac{1}{2} ft^2$ (2) $S = \frac{1}{4} ft^2$
(3) $S = \frac{1}{72} ft^2$ (4) $S = \frac{1}{6} ft^2$

65. A bullet fired into a fixed target loses half of its velocity after penetrating 3 cm. How much further it will penetrate before coming to rest assuming that it faces constant resistance to motion.

[AIEE 2005]

(1) 1.5 cm (2) 1.0 cm
(3) 3.0 cm (4) 2.0 cm

66. A particle moves along a straight line OX. At a time t (in seconds) the distance x (in metres) of the particle from O is given by $x = 40 + 12t - t^3$. How long would the particle travel before coming to rest.

[AFMC 2006; Similar WB-JEE 2012]

(1) 24 m (2) 40 m
(3) 56 m (4) 16 m

67. The acceleration a of a particle starting from rest varies with time according to relation $a = \alpha t + \beta$. The velocity of the particle after a time t will be:

[DCE 2009]

(1) $\frac{\alpha t^2}{2} + \beta$ (2) $\frac{\alpha t^2}{2} + \beta t$
(3) $\alpha t^2 + \frac{1}{2}\beta t$ (4) $\frac{\left(\alpha t^2 + \beta\right)}{2}$

68. The displacement of the particle varies with time according to the relation $x = \frac{k}{b}\left[1 - e^{-bt}\right]$. Then the velocity of the particle is:

(1) $k(e^{-bt})$ (2) $\frac{k}{b^2 e^{-bt}}$
(3) kbe^{-bt} (4) None of these

69. An aeroplane flies around a square field ABCD of each side 1000 km. Its speed along AB is 250 kmh^{-1}, along BC 500 kmh^{-1}, along CD 200 kmh^{-1}, and along DA 100 kmh^{-1}. Its average speed (in kmh^{-1}) over the entire trip is:

[Kerala PET 2010]

(1) 225.5 (2) 175.5
(3) 125.5 (4) 190.5

70. A particle is moving in a straight line and passes through a point O with a velocity of 6 ms^{-1}. The particle moves with a constant retardation of 2 ms^{-2} for 4 s and there after moves with constant velocity. How long after leaving O does the particle return to O.

(1) 3 s (2) 8 s
(3) Never (4) 4 s

71. A stone is dropped from a height h. Simultaneously, another stone is thrown up from the ground which reaches a height $4h$. The two stones cross each other after time.

(1) $\sqrt{\frac{h}{8g}}$ (2) $\sqrt{8gh}$
(3) $\sqrt{2gh}$ (4) $\sqrt{\frac{h}{2g}}$

72. A particle moves along x-axis as
$x = 4(t-2) + a(t-2)^2$
Which of the following is true

[J & K CET 2005]

(1) The initial velocity of particle is 4
(2) The acceleration of particle is $2a$
(3) The particle is at origin at $t = 0$
(4) None of these

73. The velocity of a body depends on time according to the equation $v = 20 + 0.1t^2$. The body is undergoing.

[MNR 1995; UPSEAT 2000]

(1) Uniform acceleration
(2) Uniform retardation
(3) Non-uniform acceleration
(4) Zero acceleration

74. The displacement of a particle is given by $y = a + bt + ct^2 - dt^4$. The initial velocity and acceleration are respectively.

[CPMT 1999, 2003; RPMT 2006]

(1) $b, -4d$ (2) $-b, 2c$
(3) $b, 2c$ (4) $2c, -4d$

75. The position x of a particle varies with time t as $x = at^2 - bt^3$. The acceleration of the particle will be zero at time t equal to:

[CBSE PMT 1997; BHU 1999; DPMT 2000; KCET 2000]

(1) $\frac{a}{b}$ (2) $\frac{2a}{3b}$
(3) $\frac{a}{3b}$ (4) Zero

76. The displacement of a particle starting from rest (at $t = 0$) is given by $s = 6t^2 - t^3$. The time in seconds at which the particle will attain zero velocity again, is:

[SCRA 1998]

(1) 2 (2) 4
(3) 6 (4) 8

77. The motion of a particle is described by the equation $x = a + bt^2$ where $a = 15$ cm and $b = 3$ cm/s^2. Its instantaneous velocity at time 3 sec will be:

[AMU (Med.) 2000]

(1) 36 cm/sec (2) 18 cm/sec
(3) 16 cm/sec (4) 32 cm/sec

78. The distance travelled by a particle is proportional to the squares of time, then the particle travels with.

[RPET 1999; RPMT 2000]

(1) Uniform acceleration
(2) Uniform velocity
(3) Increasing acceleration
(4) Decreasing velocity

79. The motion of a particle is described by the equation $u = at$. The distance travelled by the particle in the first 4 seconds.

[DCE 2000]

(1) $4a$ (2) $12a$
(3) $6a$ (4) $8a$

80. The relation $3t = \sqrt{3x} + 6$ describes the displacement of a particle in one direction where x is in metres and t in sec, The displacement, when velocity is zero, is:

[CPMT 2000; Similar NEET (Karnataka) 2013]

(1) 24 metres
(2) 12 metres
(3) 5 metres
(4) Zero

81. Equation of displacement for any particle is $s = 3t^3 + 7t^2 + 14t + 8$ meter. Its acceleration at time t = 1 sec is:

[CBSE PMT 2000; Kerala PET 2010]

(1) 10 m/s^2 (2) 16 m/s^2
(3) 25 m/s^2 (4) 32 m/s^2

82. Starting from rest, acceleration of a particle is $a = 2(t - 1)$. The velocity of the particle at $t = 5$ s is:

[RPET 2002; Similar WB-JEE 2009]

(1) 15 m/sec (2) 25 m/sec
(3) 5 m/sec (4) None of these

83. A particle moves along X-axis in such a way that its coordinate X varies with time t according to the equation $x = (2 - 5t + 6t^2)$ m. The initial velocity of the particle is:

[MNR 1987; MP PET 1996; Pb. PET 2004; Similar WB-JEE 2008]

(1) –5 m/s (2) 6 m/s
(3) –3 m/s (4) 3 m/s

84. The displacement of a particle is proportional to the cube of time elapsed. How does the acceleration of the particle depends on time obtained.

[Pb. PET 2001]

(1) $a \propto t^2$ (2) $a \propto 2t$
(3) $a \propto t^3$ (4) $a \propto 6t$

85. The displacement of a particle is given by $x = (t - 2)^2$ where x is in metre and t in second. The distance covered by the particle in first 4 seconds is:

[NCERT Exemplar]

(1) 4m (2) 8m
(3) 12m (4) 16 m

86. The motion of a particle along a straight line is described by equation:

$x = 8 + 12t - t^3$

where x is in metre and t in second. The retardation of the particle when its velocity becomes zero, is.

[CBSE PMT (Pre.) 2012]

(1) 24 ms^{-2} (2) Zero
(3) 6 ms^{-2} (4) 12 ms^{-2}

87. The distance travelled 'S' by an accelerated particle of mass M is given by the following relation (in MKS units)

$S = 6t + 3t^2$

The velocity of the particle after 2 seconds is:

[AMU (Engg.) 2012]

(1) 6 (2) 12
(3) 18 (4) 24

88. Two bodies of different masses m_a and m_b are dropped from two different heights a and b. The ratio of the time taken by the two to cover these distances are.

[MP PMT 1993; Similar CBSE PMT 2006]

(1) $a : b$ (2) $b : a$
(3) $\sqrt{a} : \sqrt{b}$ (4) $a^2 : b^2$

89. An object is projected upwards with a velocity of 100 m/s. It will strike the ground after (approximately).

[NCERT 1981; AFMC 1995]

(1) 10 sec (2) 20 sec
(3) 15 sec (4) 5 sec

90. A body is released from the top of a tower of height h. It takes t sec to reach the ground. Where will be the ball after time $t/2$ sec.

[NCERT 1981; MP PMT 2004]

(1) At $h/2$ from the ground
(2) At $h/4$ from the ground
(3) Depends upon mass and volume of the body
(4) At $3h/4$ from the ground

91. Free fall of an object (in vacuum) is a case of motion with.

[Kerala PET 2010]

(1) Uniform velocity
(2) Uniform acceleration
(3) Variable acceleration
(4) Constant momentum
(5) Uniform speed

92. A body starts to fall freely under gravity. The distances covered by it in first, second and third second are in ratio.

[MP PET 1997; RPET 2001; Kerala PET 2009, 12]

(1) 1 : 3 : 5 (2) 1 : 2 : 3
(3) 1 : 4 : 9 (4) 1 : 5 : 6

93. A body dropped from a height h with an initial speed zero, strikes the ground with a velocity 3 km/h. Another body of same mass is dropped from the same height h with an initial speed $-u' = 4$ km/h. Find the final velocity of second body with which it strikes the ground.

[CBSE PMT 1996]

(1) 3 km/h (2) 4 km/h
(3) 5 km/h (4) 12 km/h

94. A stone is thrown with an initial speed of 4.9 m/s from a bridge in vertically upward direction. It falls down in water after 2 sec. The height of the bridge is:

[AFMC 1999; Pb. PMT 2003]

(1) 4.9 m (2) 9.8 m
(3) 19.8 m (4) 24.7 m

95. A stone is shot straight upward with a speed of 20 m/sec from a tower 200 m high. The speed with which it strikes the ground is approximately.

[AMU (Engg.) 1999]

(1) 60 m/sec (2) 65 m/sec
(3) 70 m/sec (4) 75 m/sec

96. A body freely falling from the rest has a velocity 'v' after it falls through a height 'h'. The distance it has to fall down for its velocity to become double, is:

[BHU 1999]

(1) $2h$ (2) $4h$
(3) $6h$ (4) $8h$

97. Velocity of a body on reaching the point from which it was projected upwards, is:

[AIIMS 1999; Pb. PMT 1999]

(1) $v = 0$ (2) $v = 2u$
(3) $v = 0.5u$ (4) $v = u$

98. A body projected vertically upwards with a velocity u returns to the starting point in 4 seconds. If g = 10 m/sec^2, the value of u is:

[KCET 1999; RPMT 2006]

(1) 5 m/sec (2) 10 m/sec
(3) 15 m/sec (4) 20 m/sec

99. Time taken by an object falling from rest to cover the height of h_1 and h_2 is respectively t_1 and t_2 then the ratio of t_1 to t_2 is:

[RPMT 1999; RPET 2002]

(1) $h_1 : h_2$ (2) $\sqrt{h_1} : \sqrt{h_2}$
(3) $h_1 : 2h_2$ (4) $2h_1 : h_2$

100. A body is thrown vertically up from the ground. It reaches a maximum height of 100 m in 5 sec. After what time it will reach the ground from the maximum height position.

[Pb. PMT 2000]

(1) 1.2 sec (2) 5 sec
(3) 10 sec (4) 25 sec

101. A particle is thrown vertically upwards. If its velocity at half of the maximum height is 10 m/s, then maximum height attained by it is (Take $g = 10$ m/s^2)

[CBSE PMT 2001, 04]

(1) 8 m (2) 10 m
(3) 12 m (4) 16 m

102. A body, thrown upwards with some velocity, reaches the maximum height of 20 m. Another body with double the mass thrown up, with double initial velocity will reach a maximum height of.

[KCET 2001, BHU 2004]

(1) 200 m (2) 16 m
(3) 80 m (4) 40 m

103. Three different objects of masses m_1, m_2 and m_3 are allowed to fall from rest and from the same point 'O' along three different frictionless paths. The speed of the three objects, on reaching the ground, will be in the ratio of

[AIIMS 2002]

(1) $m_1 : m_2 : m_3$
(2) $m_1 : 2m_2 : 3m_3$
(3) 1 : 1 : 1
(4) $\frac{1}{m_1} : \frac{1}{m_2} : \frac{1}{m_3}$

104. Two balls A and B of same masses are thrown from the top of the building. A, thrown upward with velocity V and B, thrown downward with velocity V, then.

[AIEEE 2002; Odisha JEE 2009]

(1) Velocity of A is more than B at the ground
(2) Velocity of B is more than A at the ground
(3) Both A and B strike the ground with same velocity
(4) None of these

Answer Key

1. (1)	22. (4)	43. (3)	64. (3)	85. (2)
2. (3)	23. (2)	44. (2)	65. (2)	86. (4)
3. (1)	24. (2)	45. (3)	66. (4)	87. (3)
4. (2)	25. (1)	46. (4)	67. (2)	88. (3)
5. (2)	26. (4)	47. (3)	68. (1)	89. (2)
6. (3)	27. (1)	48. (1)	69. (4)	90. (4)
7. (4)	28. (3)	49. (4)	70. (2)	91. (2)
8. (1)	29. (3)	50. (2)	71. (1)	92. (1)
9. (3)	30. (2)	51. (2)	72. (2)	93. (3)
10. (4)	31. (1)	52. (1)	73. (3)	94. (2)
11. (2)	32. (2)	53. (2)	74. (3)	95. (2)
12. (3)	33. (2)	54. (1)	75. (3)	96. (2)
13. (4)	34. (4)	55. (1)	76. (2)	97. (4)
14. (3)	35. (1)	56. (1)	77. (2)	98. (4)
15. (2)	36. (4)	57. (3)	78. (1)	99. (2)
16. (4)	37. (1)	58. (1)	79. (4)	100. (2)
17. (3)	38. (2)	59. (1)	80. (4)	101. (2)
18. (3)	39. (4)	60. (3)	81. (4)	102. (3)
19. (3)	40. (2)	61. (1)	82. (1)	103. (3)
20. (2)	41. (3)	62. (1)	83. (1)	104. (3)
21. (4)	42. (3)	63. (3)	84. (4)	

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