MCQ : MOTION

1. Which of the following is a vector quantity?
   a) Speed
   b) Distance
   c) Velocity
   d) Path length
   Ans: c

2. Displacement of an object can be:
   a) Zero
   b) Negative
   c) Equal to distance
   d) All of these
   Ans: d

3. A farmer moves along the boundary of a square field of side 10 m in 40 s. The magnitude of his displacement after 2 minutes 20 seconds is:
   a) 10 m
   b) 20 m
   c) 14.14 m
   d) 0 m
   Ans: c

4. Which instrument is used in vehicles to measure distance travelled?
   a) Odometer
   b) Speedometer
   c) Barometer
   d) Ammeter
   Ans: a

5. A body moving along a circular path with constant speed has:
   a) Zero acceleration
   b) Uniform velocity
   c) Changing velocity
   d) No displacement
   Ans: c

6. The slope of a distance-time graph represents:
   a) Distance
   b) Velocity
   c) Acceleration
   d) Displacement
   Ans: b

7. The SI unit of speed is:
   a) km/h
   b) cm/s
   c) m/s
   d) km/s
   Ans: c

8. The average speed of a moving body is defined as:
   a) Distance × time
   b) Distance / time
   c) Time / distance
   d) None of these
   Ans: b

9. If displacement of a moving object is zero, then its:
   a) Speed is zero
   b) Distance is zero
   c) Velocity is zero
   d) Average velocity is zero
   Ans: d

10. The acceleration of a body moving with constant velocity is:
   a) Zero
   b) Constant
   c) Variable
   d) Infinite
   Ans: a

11. Which of the following is not a scalar quantity?
   a) Speed
   b) Distance
   c) Velocity
   d) Time
   Ans: c

12. Which physical quantity is given by the slope of a velocity–time graph?
   a) Speed
   b) Distance
   c) Acceleration
   d) Momentum
   Ans: c

13. Displacement can never be:
   a) Negative
   b) Greater than distance
   c) Equal to distance
   d) Zero
   Ans: b

14. If a body returns to its initial position, its displacement is:
   a) Zero
   b) Equal to distance
   c) Maximum
   d) Cannot say
   Ans: a

15. The area under a velocity–time graph gives:
   a) Acceleration
   b) Displacement
   c) Speed
   d) Momentum

Ans: b

16. The SI unit of acceleration is:
    a) m/s
    b) m/s^2
    c) m/s^3
    d) m/s^{-1}
    Ans: b

17. When the velocity of a body decreases with time, the acceleration is:
    a) Positive
    b) Negative
    c) Zero
    d) Infinite
    Ans: b

18. Motion of a body along a straight line is called:
    a) Circular motion
    b) Rectilinear motion
    c) Rotational motion
    d) Random motion
    Ans: b

19. If speed-time graph of a body is a straight line parallel to time axis, motion is:
    a) Uniform
    b) Accelerated
    c) Retarded
    d) Variable
    Ans: a

20. Which of the following is dimensionally equal to velocity?
    a) Distance / time
    b) Acceleration × time
    c) Momentum / mass
    d) All of these
    Ans: d

21. Which type of motion is shown by the hands of a clock?
    a) Rectilinear
    b) Circular
    c) Oscillatory
    d) Random
    Ans: b

22. The slope of a speed-time graph in uniform motion is:
    a) Zero
    b) Positive
    c) Negative
    d) Infinite
    Ans: a

23. The average velocity of a body can be zero if:
    a) Distance is zero

b) Displacement is zero
c) Time is zero
d) Speed is zero
Ans: b

24. In SI system, unit of displacement is:
a) cm
b) m
c) km
d) Any of these
Ans: b

25. Which of the following can be negative?
a) Speed
b) Distance
c) Displacement
d) Mass
Ans: c

26. Which of the following equations of motion is dimensionally correct?
a) $v = u + at$
b) $s = ut + \frac{1}{2} at^2$
c) $v^2 - u^2 = 2as$
d) All of these
Ans: d

27. A body covers equal distance in equal intervals of time. Its motion is:
a) Uniform
b) Non-uniform
c) Accelerated
d) Random
Ans: a

28. Which graph is a straight line?
a) s–t graph in uniform motion
b) v–t graph in uniform acceleration
c) Both (a) and (b)
d) None
Ans: c

29. Which of the following is an example of uniformly accelerated motion?
a) Motion of ball thrown vertically upward
b) Motion of a freely falling body
c) Both (a) and (b)
d) Car moving at constant speed
Ans: c

30. Which one is not a unit of speed?
a) m/s
b) km/h
c) cm/min
d) kg/s

Ans: d

31. A car travels 100 km in 2 hours. Its average speed is:
    a) 25 km/h
    b) 50 km/h
    c) 100 km/h
    d) 200 km/h
    Ans: b

32. An object travels 16 m in 4 s and another 16 m in 2 s. Average speed = ?
    a) 4.5 m/s
    b) 5.33 m/s
    c) 6 m/s
    d) 3.2 m/s
    Ans: b

33. A bus decreases its speed from 80 km/h to 60 km/h in 5 s. Acceleration = ?
    a) –2 m/s²
    b) –1.1 m/s²
    c) –5 m/s²
    d) –4 m/s²
    Ans: a

34. A train starting from rest attains 72 km/h in 5 min. Acceleration = ?
    a) 0.05 m/s²
    b) 0.1 m/s²
    c) 0.2 m/s²
    d) 1 m/s²
    Ans: c

35. In Q34, the distance travelled by train = ?
    a) 2 km
    b) 3 km
    c) 5 km
    d) 6 km
    Ans: b

36. A car accelerates uniformly from 18 km/h to 36 km/h in 5 s. Distance covered = ?
    a) 25 m
    b) 30 m
    c) 37.5 m
    d) 40 m
    Ans: c

37. A bus starting from rest moves with acceleration 0.1 m/s² for 2 min. Distance travelled = ?
    a) 36 m
    b) 72 m
    c) 720 m
    d) 144 m
    Ans: c

38. A ball is dropped from 20 m. With g = 10 m/s², time taken to hit ground = ?
    a) 2 s

b) 4 s
c) 6 s
d) 8 s
Ans: a

39. In Q38, velocity with which ball strikes ground = ?
a) 10 m/s
b) 20 m/s
c) 40 m/s
d) 30 m/s
Ans: b

40. An artificial satellite orbits Earth in 24 h at radius 42250 km. Speed = ?
a) 2 km/s
b) 3 km/s
c) 5 km/s
d) 7.5 km/s
Ans: b

41. A car travels 60 km in 1.5 h. Its average speed is:
a) 20 km/h
b) 30 km/h
c) 40 km/h
d) 45 km/h
Ans: c

42. A train covers 120 km in 2 h and returns in 3 h. Average speed = ?
a) 36 km/h
b) 40 km/h
c) 45 km/h
d) 48 km/h
Ans: b

43. A particle accelerates uniformly from rest to 10 m/s in 5 s. Acceleration = ?
a) 1 m/s²
b) 2 m/s²
c) 5 m/s²
d) 10 m/s²
Ans: b

44. In Q43, distance travelled = ?
a) 15 m
b) 25 m
c) 50 m
d) 100 m
Ans: c

45. A car is moving at 20 m/s. If brakes produce deceleration of 2 m/s², stopping distance = ?
a) 100 m
b) 150 m
c) 200 m
d) 250 m
Ans: a

46. A stone falls from a building 45 m high. Time taken = ? (g = 10 m/s²)
    a) 2 s
    b) 3 s
    c) 4 s
    d) 5 s
    Ans: b

47. A body moving with 10 m/s comes to rest in 5 s. Retardation = ?
    a) –1 m/s²
    b) –2 m/s²
    c) –3 m/s²
    d) –4 m/s²
    Ans: b

48. In Q47, distance covered = ?
    a) 12.5 m
    b) 20 m
    c) 25 m
    d) 30 m
    Ans: c

49. A truck moving at 54 km/h is stopped in 5 s. Retardation = ?
    a) 2 m/s²
    b) 3 m/s²
    c) 4 m/s²
    d) 5 m/s²
    Ans: c

50. In Q49, distance travelled before stopping = ?
    a) 35 m
    b) 55 m
    c) 65 m
    d) 75 m
    Ans: b

51. A bullet moving at 300 m/s hits a target and penetrates 0.15 m. Retardation = ?
    a) 1.5×10^5 m/s²
    b) 2×10^5 m/s²
    c) 3×10^5 m/s²
    d) 4×10^5 m/s²
    Ans: b

52. A train starting from rest attains speed of 72 km/h in 5 min. Acceleration = ?
    a) 0.1 m/s²
    b) 0.2 m/s²
    c) 0.3 m/s²
    d) 0.4 m/s²
    Ans: b

53. In Q52, distance travelled = ?
    a) 200 m
    b) 500 m
    c) 600 m

d) 900 m
Ans: d

54. A ball thrown upward at 20 m/s. Maximum height = ? (g = 10 m/s²)
a) 10 m
b) 15 m
c) 20 m
d) 30 m
Ans: d

55. In Q54, total time of flight = ?
a) 2 s
b) 3 s
c) 4 s
d) 5 s
Ans: c

56. A car travels first 40 km at 60 km/h and next 60 km at 40 km/h. Average speed = ?
a) 45 km/h
b) 48 km/h
c) 50 km/h
d) 52 km/h
Ans: b

57. A particle covers 15 m in first second, 25 m in next second. Acceleration = ?
a) 5 m/s²
b) 8 m/s²
c) 10 m/s²
d) 12 m/s²
Ans: a

58. A car is moving at 20 m/s. In 10 s, it attains 30 m/s. Distance covered = ?
a) 200 m
b) 250 m
c) 300 m
d) 350 m
Ans: b

59. A bus starting from rest attains 72 km/h in 20 s. Distance covered = ?
a) 150 m
b) 200 m
c) 250 m
d) 300 m
Ans: c

60. A body moving with uniform acceleration covers 100 m in 10 s. If u = 5 m/s, acceleration = ?
a) 0.5 m/s²
b) 1 m/s²
c) 1.5 m/s²
d) 2 m/s²
Ans: b

61. The slope of a distance-time graph gives:
a) Speed

b) Acceleration
c) Distance
d) Time
Ans: a

62. The area under a velocity-time graph represents:
a) Speed
b) Acceleration
c) Distance/Displacement
d) Momentum
Ans: c

63. For a body moving with uniform velocity, the v–t graph is:
a) A straight line parallel to x-axis
b) A straight line through origin
c) A parabola
d) An irregular curve
Ans: a

64. In a distance-time graph, a horizontal line parallel to time axis shows:
a) Accelerated motion
b) Decelerated motion
c) At rest
d) Uniform speed
Ans: c

65. In a v–t graph, a straight line inclined to time axis indicates:
a) Rest
b) Uniform acceleration
c) Non-uniform acceleration
d) Uniform velocity
Ans: b

66. The distance covered by a car between 2 s and 5 s can be obtained by:
a) Area under v–t graph between t = 2 and t = 5
b) Slope of v–t graph
c) Area under s–t graph
d) Slope of s–t graph
Ans: a

67. The graph of non-uniform motion is:
a) Straight line
b) Curved line
c) Parallel line
d) None
Ans: b

68. If distance-time graph is curved upward, motion is:
a) Accelerated
b) Uniform
c) Retarded
d) Constant

Ans: a

69. In v–t graph, area of a triangle gives:
    a) Acceleration
    b) Distance
    c) Velocity
    d) Speed
    Ans: b

70. The distance-time graph of a body moving with constant speed is:
    a) Straight line passing through origin
    b) Curve
    c) Zig-zag line
    d) Horizontal line
    Ans: a

71. In a v–t graph, the slope represents:
    a) Speed
    b) Distance
    c) Acceleration
    d) Momentum
    Ans: c

72. In a v–t graph, area under the graph gives:
    a) Speed
    b) Displacement
    c) Acceleration
    d) Time
    Ans: b

73. A straight line inclined upwards in v–t graph indicates:
    a) Uniform speed
    b) Uniform acceleration
    c) Uniform retardation
    d) Rest
    Ans: b

74. A horizontal line in v–t graph indicates:
    a) Uniform velocity
    b) Non-uniform velocity
    c) Rest
    d) Acceleration
    Ans: a

75. The s–t graph of a body at rest is:
    a) Straight line with positive slope
    b) Straight line parallel to time axis
    c) Curve
    d) None
    Ans: b

76. In s–t graph, slope represents:
    a) Acceleration
    b) Speed / velocity

c) Distance
d) Momentum
Ans: b

77. A curved line in s–t graph indicates:
a) Uniform speed
b) Non-uniform motion
c) Rest
d) None
Ans: b

78. If v–t graph is a straight line inclined negatively with time axis, body is:
a) At rest
b) Accelerated
c) Retarded
d) Uniform
Ans: c

79. If slope of v–t graph is zero, body has:
a) Uniform velocity
b) Uniform acceleration
c) Rest
d) Zero displacement
Ans: a

80. If distance–time graph is a straight line passing through origin, motion is:
a) Accelerated
b) Uniform
c) Retarded
d) Oscillatory
Ans: b

81. A racing car has uniform acceleration of 4 m/s². Distance covered in 10 s = ?
a) 100 m
b) 200 m
c) 400 m
d) 500 m
Ans: c

82. A stone is thrown upward with 5 m/s. Maximum height attained = ?
a) 0.5 m
b) 1.25 m
c) 2.5 m
d) 5 m
Ans: b

83. A bus moves with constant acceleration. If it covers 100 m in 10 s and 225 m in 15 s, initial velocity = ?
a) 5 m/s
b) 10 m/s
c) 15 m/s
d) 20 m/s

Ans: a

84. A car moving at 52 km/h is stopped by brakes in 2 s. Distance covered before stopping = ?
    a) 10 m
    b) 15 m
    c) 12 m
    d) 20 m
    Ans: c

85. A train 100 m long moving at 10 m/s passes a bridge 900 m long. Time taken = ?
    a) 80 s
    b) 90 s
    c) 100 s
    d) 120 s
    Ans: b

86. A bullet moving at 150 m/s penetrates a target and comes out with 50 m/s. If target is 1 m thick, average acceleration = ?
    a) –5000 m/s²
    b) –10000 m/s²
    c) –15000 m/s²
    d) –20000 m/s²
    Ans: b

87. A man swims downstream 2 km in 20 min and upstream 2 km in 40 min. Speed of man in still water = ?
    a) 2 km/h
    b) 3 km/h
    c) 4 km/h
    d) 5 km/h
    Ans: c

88. A body moves 40 km north, then 30 km east. Net displacement = ?
    a) 50 km
    b) 70 km
    c) 10 km
    d) 25 km
    Ans: a

89. A car travels first half distance at 40 km/h and next half at 60 km/h. Average speed = ?
    a) 45 km/h
    b) 48 km/h
    c) 50 km/h
    d) 52 km/h
    Ans: b

90. If velocity-time graph is a straight line inclined negatively, motion is:
    a) Accelerated
    b) Decelerated
    c) Uniform
    d) Rest
    Ans: b

91. If a car covers first 1 km in 1 min and next 1 km in 2 min, average speed = ?
    a) 20 km/h
    b) 30 km/h
    c) 40 km/h
    d) 25 km/h
    Ans: a

92. A ball dropped from a height passes a point at 5 m/s and 25 m below passes at 15 m/s. Acceleration = ?
    a) 5 m/s²
    b) 10 m/s²
    c) 15 m/s²
    d) 20 m/s²
    Ans: b

93. A particle moving in uniform circular motion has:
    a) Zero acceleration
    b) Uniform acceleration towards center
    c) Uniform velocity
    d) No force
    Ans: b

94. The relation between u, v, a, and s is:
    a) $v = u + at$
    b) $s = ut + \frac{1}{2} at^2$
    c) $v^2 - u^2 = 2as$
    d) All of these
    Ans: d

95. A body covers distances 10 m, 20 m, 30 m in first, second, third second. Acceleration = ?
    a) 5 m/s²
    b) 10 m/s²
    c) 2 m/s²
    d) 4 m/s²
    Ans: b

96. A car moving at 54 km/h stops in 5 s after brakes applied. Retardation = ?
    a) 2 m/s²
    b) 3 m/s²
    c) 4 m/s²
    d) 5 m/s²
    Ans: b

97. In Q85, distance travelled before stopping = ?
    a) 35 m
    b) 37.5 m
    c) 40 m
    d) 42.5 m
    Ans: b

98. A bus covers 1st km in 2 min and next km in 1 min. Average speed = ?
    a) 20 km/h
    b) 30 km/h
    c) 40 km/h

d) 60 km/h
Ans: b

99. A car covers first half at 40 km/h and next half at 60 km/h. Average speed = ?
a) 45 km/h
b) 48 km/h
c) 50 km/h
d) 55 km/h
Ans: b

100. A particle starts from rest with 2 m/s² acceleration. Distance travelled in 5 s = ?
a) 10 m
b) 15 m
c) 20 m
d) 25 m
Ans: d

101. A freely falling body covers distance 45 m in last second of fall. Time of fall = ?
a) 3 s
b) 4 s
c) 5 s
d) 6 s
Ans: c