EXERCISE-1

A. Very Short Answer Type Questions

- Q.1 Can the speed of a body moving with a constant velocity change ?
- **Q.2** Can the velocity of a body moving with a uniform speed change ?
- Q.3 Can average velocity of a moving body be zero?
- Q.4 Can average speed of a moving body be zero?
- **Q.5** Time-displacement graph is a straight line parallel to the time axis. What is its velocity and the acceleration ?
- **Q.6** What is the acceleration of a body moving with constant velocity ?
- **Q.7** A stone is thrown upwards, reaches a height h and comes back. What are the distance moved and displacement ?
- **Q.8** A particle moves along the circumference of a circle in half cycle. Calculate the distance travelled and displacement.
- **Q.9** Define uniform circular motion.
- **Q.10** What is the relation between linear velocity and angular velocity ?
- **Q.11** Does uniform circular motion has accelerated motion or no acceleration at all ?
- Q.12 What is the direction of angular velocity ?
- Q.13 In uniform circular motion, does the angular velocity remain constant or if changes with time.
- Q.14 A car starts moving with 20 m/s and its velocity becomes 80 m/s after 6 sec. Calculate its acceleration.
- Q.15 A body is thrown vertically up with a velocity 98 m/s. How much high it will rise ? (g = 9.8 m/s²).
- Q.16 A body falls from a height of 500 m. In how much time, will it strike the ground ?

Q.17 Time-displacement graphs of two bodies A and B are shown in the Figure. Which one has larger velocity ?



Q.18 The velocity of a body is 72 km/hr. Calculate its value in m/s.

B. Short Answer Type Questions

- Q.19 Define state of motion.
- **Q.20** Differentiate between the following :

(i) speed and velocity,

(ii) distance and displacement

- Q.21 Displacement of a body can be zero even when the distance travelled is not zero. Explain.
- **Q.22** What do you mean by negative and positive acceleration ? Explain.
- Q.23 A train is moving with a constant speed of 40 km/hr. Draw time-speed graph. From this, draw time-distance graph upto 5 hours from the start.
- Q.24 Draw the graph for uniform motion.
 - (i) Displacement Time
 - (ii) Velocity Time
- **Q.25** In the given figure A and B represent uniform motion or accelerated motion.



Q.26 In the given Figure. What type of motion are represented by the parts AB, BC, CD and DE.



- **Q.27** For a moving body distance travelled is directly proportional to the time. What do you conclude about its speed ?
- Q.28 Figure shows the time velocity graphs for three bodies A, B and C.



- (i) Which body has minimum acceleration?
- (ii) Which body has maximum acceleration?
- Q.29 A body starting with initial velocity u moves with a constant acceleration a. Find the expression for distance travelled in nth seconds.
- **Q.30** A body starting from rest moves with a constant acceleration. It moves a distance s_1 in first 5 seconds and a distance s_2 in next 5 seconds. Prove that $\Delta s_2 = 3s_1$.
- Q.31 An engine is moving with a velocity 44 m/s. After applying the brakes, it stops after covering a distance of 121 m. Calculate retardation and time taken by the engine to stop.
- **Q.32** A body is thrown vertically up with an initial velocity of 60 m/s. If $g = 10 \text{ m/s}^2$, at what time, it will be at a height of 100 m.

C. Long Answer Type Questions

- **Q.33** What do you mean by average speed ? How will you find average speed from time-distance graph ?
- Q.34 What is the difference between time-speed and time-velocity graph ? In what condition, they are similar ?
- **Q.35** What do you mean by acceleration ? How do you find acceleration from time-velocity graph?

- **Q.36** Time-velocity graph of a body is shown in figure Calculate the following :
 - (i) Distance travelled in first 10 s
 - (ii) Acceleration at t = 15 s
 - (iii) Acceleration between t = 20 s to t = 25s.



Q.37 Time velocity graph of a moving body is shown in figure Calculate the following :



- (i) Change in velocity during t = 6s to t = 8s
- (ii) Average acceleration during t = 10s to t = 12s.
- (iii) In which time interval acceleration will be zero.

(iv) Acceleration during t = 14 s to t = 16 s.

Q.38 Time-acceleration graph of a moving body is shown in figure Calculate the following :



- (i) Time interval in which acceleration will be zero.
- (ii) Acceleration at t = 5 s.
- (iii) Change in velocity during time interval t = 4s and t = 8 s.
- Q.39 An artificial satellite is moving in a circular orbit of radius 42, 250 km. Find its speed if it takes 24 hours to revolve round the earth.
- Q.40 On 120 km track, a train travels the first 30 km with a uniform speed of 30 km/h. How fast must the train travel the next 90 km so as to average 60 km/hr for entire trip ?

EXERCISE-2

Single Correct Answer Type Questions

- 0.1 A body whose position with respect to surrounding does not change, is said to be in a state of -(A) Rest (B) Motion
 - (C) Vibration (D) Oscillation
- Q.2 In case of a moving body-(A) Displacement > Distance (B) Displacement < Distance (C) Displacement \geq Distance (D) Displacement \leq Distance
- Q.3 Vector quantities are those which have : (A) Only direction
 - (B) Only Magnitude

 - (C) Magnitude and direction both
 - (D) None of these
- **Q.4** What is true about scalar quantities?
 - (A) Scalars quantities have direction also.
 - (B) Scalars can be added arithmetically.
 - (C) There are special laws for scalar addition.
 - (D) Scalars have special method to represent.
- 0.5 A body is said to be in motion if -
 - (A) Its position with respect to surrounding objects remains same
 - (B) Its position with respect to surrounding objects keep on changing
 - (C) both (A) and (B)
 - (D) Neither (A) nor (B)
- Q.6 A distance is always-
 - (A) shortest length between two points
 - (B) path covered by an object between two points
 - (C) product of length and time
 - (D) none of the above
- 0.7 A displacement-
 - (A) is always positive
 - (B) is always negative
 - (C) may be positive as well as negative
 - (D) is neither positive nor negative
- **Q.8** Examples of vector quantities are:
 - (A) velocity, length and mass
 - (B) speed, length and mass
 - (C) time, displacement and mass
 - (D) velocity, displacement and force

- Q.9 Which of the following is not characteristic of displacement?
 - (A) It is always positive.
 - (B) It has both magnitude and direction.
 - (C) It can be zero.
 - (D) Its magnitude is less than or equal to the actual path length of the object.
- Q.10 S.I. unit of displacement is-(b) ms^{-1} (A) m $(C) ms^{-2}$ (D) none of these
- Q.11 Which of the following is not a vector? (A) Speed (B) Velocity (C) Weight (D) Acceleration
- Q.12 Time is an example of:-
 - (A) Scalar
 - (B) Vector
 - (C) Scalar or vector
 - (D) Neither scalar nor vector
- In five minutes distance between a pole and a Q.13 car changes progressively. What is true about the car?
 - (A) Car is at rest
 - (B) Car is in motion
 - (C) Nothing can be said with this information
 - (D) None of the above
- Q.14 A distance -
 - (A) Is always positive
 - (B) Is always negative
 - (C) May be positive as well as negative
 - (D) Is neither positive nor negative
- 0.15 When a body covers equal distance in equal intervals of time, its motion is said to be : (A) Non-uniform
 - (B) Uniform
 - (C) Accelerated
 - (D) Back and forth
- The motion along a straight line is called: Q.16
 - (A) Vibratory (B) Stationary
 - (C) Circular (D) Linear

Q.17	A particle is travelin This means-	ng with a constant speed.									
	(A) Its position re	mains constant as time									
	(B) It covers equal distances in equal interval										
	of time (C) Its acceleration is zero										
	(D) It does not change its direction of motion										
0.18	The rate of change of displacement is -										
Q.10	(A) Speed	(B) Velocity									
	(C) Acceleration	(D) Retardation									
Q.19	Speed is never -										
	(A) Zero	(B) Fraction									
	(C) Negative	(D) Positive									
Q.20	The motion of a	body covering different									
	distances in same ir	ntervals of time is said to									
	be - (A) Zia Zaa	(D) Fost									
	(C) Slow	(D) Variable									
Q.21	Unit of velocity is :	(D) -1									
	(A) ms (C) ms^{-2}	$(B) ms^{-1}$									
	(C) ms	(D) none of these									
Q.22	Metre per second is	not the unit of -									
	(A) Displacement	(B) Velocity									
	(C) Speed	(D) None of them									
Q.23	A particle moves v	vith a uniform velocity -									
	(A) The particle mus	st be at rest									
	(B) The particle model (C) The particle model (C)	ves along a circle									
	(D) The particle mov	ves along a straight line									
0.14	A quantity has value	a = 1 It may be									
Q.24	the-	c of -0.0 ms . It may be									
	(A) Speed of a partic	cle									
	(B) Velocity of a par	rticle									
	(C) Position of a par	ticle									
	(D) Displacement of	a particle									
Q.25	In 10 minutes, a car	r with speed of 60 kmh ⁻¹									
	travels a distance of	-									
		(1) (001									

(A) 6 km	(B) 600 km
(C) 10 km	(D) 7 km

- Q.26 A particle covers equal distances in equal intervals of time, it is said to be moving with uniform
 (A) Speed
 (B) Velocity
 (C) Acceleration
 (D) Retardation

 Q.27 The SI unit of the average velocity is
 (A) m/s
 (B) km/s
 (C) cm/s
 (D) mm/s
- Q.28A car accelerates uniformly from 18 km/h to
36 km/h in 5 s. The acceleration in ms⁻² is -
(A) 1
(B) 2
(C) 3
(D) 4

Q.29 Out of energy and acceleration which is vector ?(A) Acceleration (B) Energy

- (C) Both (D) None of these
- Q.30 C.G.S. unit of acceleration is -(A) ms⁻² (B) cm s⁻² (C) ms⁻² (D) cm s²

Q.31 A train starting from a railway station and moving with uniform acceleration, attains a speed of 40 kmh⁻¹ in 10 minutes. Its acceleration is -(A) 18.5 ms⁻² (B) 1.85 cm s⁻² (C) 18.5 cms⁻² (D) 1.85 m s⁻²

- Q.32 The brakes applied to a car produce a negative acceleration of $6ms^{-2}$. If the car stops after 2 seconds, the initial velocity of the car is -(A) 6 ms⁻¹ (B) 12 ms⁻¹ (C) 24 ms⁻¹ (D) Zero
- Q.34 In 12 minutes a car whose speed is 35 kmh⁻¹ travels a distance of -
 - (A) 7 km (B) 3.5 km
 - (C) 14 km (D) 28 km

Q.35 A body is moving along a straight line at 20 ms⁻¹ undergoes an acceleration of 4 ms⁻². After 2 s, its speed will be-(A) 8 ms^{-1} (D) 12 ms⁻¹

$(A) \delta ms$	(B) 12 ms
(C) 16 ms^{-1}	(D) 28 ms^{-1}

- Q.36 A car increase its speed from 20 kmh⁻¹ to 50 kmh^{-1} in 10 s., its acceleration is (A) 30 ms⁻² (B)3 ms⁻¹ (C) 18 ms⁻² (D) 0.83 ms⁻²
- Q.37 When the distance travelled by an object is directly proportional to the time, it is said to travel with-
 - (A) zero velocity
 - (B) constant speed
 - (C) constant acceleration
 - (D) uniform velocity
- Q.38 A body freely falling from rest has a velocity v after it falls through a height h. The distance it has to fall further for its velocity to become double is (A) 3 h
 (B) 6 h

(11) 5 11	$(\mathbf{D}) \circ \mathbf{n}$
(C) 8 h	(D) 10 h

- **Q.39** 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 (A) 10×10^4 m/s² (B) 1.2×10^4 m/s² (C) 13.5×10^4 m/s² (D) 15×10^4 m/s²
- Q.40 A body starts falling from height 'h' and travels distance h/2 during the last second of motion. The time of travel (in sec.) is-
 - (A) $\sqrt{2} 1$ (B) $2 + \sqrt{2}$ (C) $\sqrt{2} + \sqrt{3}$ (D) $\sqrt{3} + 2$
- Q.41 Area between speed-time graph and time axis gives-

(A) Distance	(B) Velocity
(C) Speed	(D) None of these

Q.42 An object undergoes an acceleration of 8ms⁻² starting from rest. Distance travelled in 1 sec. is-

(A) 2 m	(B) 4 m
(C) 6 m	(D) 8 m

Q.43 The velocity-time graph of a body moving in a straight line is shown in figure. The displacement and distance travelled by the body in 6 second are respectively-



Q.44 For the velocity time graph shown in figure, the distance covered by the body in the last two seconds of its motion is what fraction of the total distance covered in all the seven seconds ?



Q.45 Velocity-time graph AB (Figure) shows that the body has-



- (A) A uniform acceleration
- (B) A non uniform retardation
- (C) Uniform speed
- (D) Initial velocity OA and is moving with uniform retardation



- (A) Backwards with uniform velocity
- (B) Forward with uniform velocity
- (C) Backward with non-uniform velocity
- (D) Forward with non-uniform velocity

Q.47 1^{C} is equal to-(A) 57.3° (B) 573° (C) 180° (D) 360°

Q.48 An athlete complete one round of a circular track of diameter 200 m in 40 s. What will be the displacement at the end of 2 minutes 40 s. ?

(A) 2200 m	(B) 220 m
(C) 22 m	(D) Zero

- Q.49 What will be the distance in the above question? (A) 2512 m (B) 2500 m (C) 2200 m (D) Zero
- **Q.50** The distance travelled by a body is directly proportional to the time, then the body is said to have -
 - (A) Zero speed(B) Zero velocity(C) Constant speed(D) None of these
- Q.51 An athlete runs along a circular track of diameter 28 m. The displacement of the athlete after he completes one circle is -

(A) 28 m	(B) 88 m
(C) 44 m	(D) Zero

Q.52 A boy is running along a circular track of radius 7 m. He completes one circle in 10 second. The average velocity of the boy is -

(A) 4.4 ms^{-1}	(B)	0.7 ms^-
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(C) Zero (D) 70 ms^{-1}

- **Q.53** A body is moving with a uniform speed of 5 ms^{-1} in a circular path of radius 5 m. The acceleration of the body is:
- $\begin{array}{c} (A) 25 \text{ ms}^{-2} & (B) 15 \text{ ms}^{-2} \\ (C) 5 \text{ ms}^{-2} & (D) 1 \text{ ms}^{-2} \\ \text{Unit of angular velocity is } \\ (A) \text{ rad} & (B) \text{ m/s} \\ (C) \text{ rad/s}^2 & (D) \text{ rad/s} \end{array}$
- Q.55 Two bodies in circular paths of radii 1 : 2 take same time to complete their circles. The ratio of their linear speeds is-
 - (A) 1 : 2 (C) 1 : 3 (C) 2 : 1 (D) 3 : 1
- Q.56 In a circular path of radius 1 m, a mass of 2 kg moves with a constant speed of 10 ms⁻¹. The angular speed in radian/sec. is -
 - (A) 5 (B) 10 (C) 15 (D) 20
- **Q.57** The relation among v, ω and r is -
 - (A) $\omega = \frac{v}{r}$ (B) $v = \frac{\omega}{r}$ (C) $\omega = \frac{r}{v}$ (D) None of these
- Q.58 Uniform circular motion is an example of : (A) Constant acceleration (B) Variable acceleration
 - (C) A and B both
 - (D) None of these
- Q.59 Rate of change of angular velocity refer to :(A) angular speed(B) angular displacement(C) angular acceleration
 - (D) None of these
- **Q.60** A car travels $\left(\frac{1}{4}\right)^{th}$ of a circle with radius r. The ratio of the distance to its displacement

The ratio of the distance to its displacement is-

(A) 1:
$$\frac{\pi}{2\sqrt{2}}$$
 (B) $\frac{\pi}{2\sqrt{2}}$:1
(C) $2\sqrt{2}:\pi$ (D) $\pi 2\sqrt{2}:1$

ANSWER KEY

EXERCISE - 1									
1. no	2.yes	3. yes							
4. no	5. 0, 0	6. 0							
7. 2h, 0	8. πr, 2r	10. $v = r\omega$							
11. accelerated motion	12. along the axis of rotation	13. remains constant							
14. $10m/sec^2$	15. 490 m	16. 10s							
17. A	18. 20 m/sec								
27. A→uniform motion, B→acce	lerated motion	28. (i) A, (ii) C							
31. 8 m/sec ² , 5.5s	32. 2s, 10s	36. (i) 300 m (ii) 0 m/s ² , (iii) –6 m/s ²							
37. (i) 30 m/s, (ii) 0, (iii) 10 to 14	4 s, (iv) – 15 m/s ²	38. (i) 2 to 4s, (ii) -15 m/s^2 (iii) 30 m/s							
39. 3.1 km/sec	40. 90 km/h								

EXERCISE - 2

Ques	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	Α	D	С	В	В	В	С	D	Α	Α	Α	Α	В	Α	В
Ques	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans	D	В	В	С	D	В	Α	D	В	С	Α	Α	Α	Α	В
Ques	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
Ans	В	В	С	Α	D	D	В	Α	D	В	Α	В	Α	В	D
Ques	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans	Α	Α	D	Α	C	D	C	С	D	Α	В	Α	В	С	В