AAFAQ ACADEMY – KASUR

Paper: Physics   **Chapter (3)**   **Class: F.Sc. Part – I**
MOTION AND FORCE
Name: _____ **Roll No: (in words)** _____
MORNING GROUP

OBJECTIVE TYPE

Total Marks: 11   **Paper Code:** _____   **Total Time: 10 Minutes**

NOTE: Write your **Roll No.** in space provided. Using lead pencil will result in loss of marks.

Q.No.1: You have four choices for each objective type question as A,B,C and D. The choice which you think is correct; fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

Sr. No.	QUESTION	A	B	C	D
1.	A boy drops a coin from the window of a moving train. The path of the coin according to a stationary observer outside the traiin will be	Vertical straight line	Parabolic	Circular	Elliptical
2.	Slope or tangent at any instant on the displacement – time graph gives	Instantaneous acceleration	Uniform acceleration	Variable acceleration	None of these
3.	Motion in two dimensions is described by	Cylindrical coordinates	Spherical coordinates	Cartesian coordinates	All of these
4.	A bullet of $10g$ is fired from a rifle of $10kg$ with a velocity of $100m \bullet s^{-1}$. The recoil velocity of rifle is	$0 \bullet 1m \bullet s^{-1}$	$1m \bullet s^{-1}$	$0 \bullet 01m \bullet s^{-1}$	$1 \bullet 1m \bullet s^{-1}$
5.	If a force of $100N$ acts on a body for $10s$, then change in momentum will be	$1000N \bullet s$	$100N \bullet s$	$10N \bullet s$	$10000N \bullet s$
6.	Which of these laws introduce the idea of force?	Newton's 1st law	Newton's 2nd law	Newton's 3rd law	All of these
7.	Gravitational and inertial masses are	Opposite	Always zero	Proportional	Identical
8.	If $\vec{a}$ and $\vec{v}$ have same signs, then velocity of body is	Decreasing	Increasing	Variable	Constant
9.	Two balls are projected in direction at 30^0 and 60^0 with the horizontal. If both attains the same height, the ratio of their initial speed is	$2: 3$	$3:2$	$3:1$	$1: 3$
10.	Velocity of projectile thrown in the upward direction is minimum at	A point just before hitting the ground	Point of projection	Both (A) and (B)	Maximum height
11.	The path of projectile neglecting air friction is	Elliptical	Parabolic	Hyperbolic	Translational

SUBJECTIVE TYPE

Total Marks: 18   **Time Allowed: 0 Hours 50 Minutes**
SECTION – I (SHORT QUESTIONS)

2. Attempt any FIVE questions. _____ **(5×2=10)Marks**

i. Explain the circumstances in which the velocity $\vec{v}$ and acceleration $\vec{a}$ of a car are **(a)** parallel **(b)** $\vec{v}$ is zero but $\vec{a}$ is not zero.

ii. Can the velocity of an object reverse the direction? Ehen acceleration is constant? If so give an example.

iii. An object is thrown vertically upward. Discuss the sign of acceleration due to gravity, relative to velocity, while the object is in air.

iv. A man standing on the top of a tower throws a ball straight up with initial velocity $\vec{v}_i$ and at the same time throws a second ball straight downward with the same speed. Which ball will have larger speed when it strikes the ground? Ignore air friction.

v. At what point or points during the projectile motion, speed will be minimum and maximum?

vi. State the law of conservation of linear momentum, pointing out the importance of isolated system. Explain, why under certain conditions, the law is useful even though the system is not completely isolated?

vii. Define time of flight and range of projectile.

SECTION – II (ESSAY TYPE) Attempt given question

3. Do as directed...

i. What is projectile motion? Find the relations for maximum range and maximum height of the projectile. (5)

ii. Two masses m_1 and m_2 are initially at rest with a spring compressed between them. What is the ratio of their velocities after the spring has been removed? (3)

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SECTION – III (Practical)

4.   **(a) Write answer of TWO questions.**   **(2×2=4)**
  i.   Find formula for acceleration due to gravity in mass – spring system.
  ii.   What is spring constant? Give its dimensions.
  iii.   What is Hooke's law?

4.   **(b)** Write procedure to determine the acceleration due to gravity by mass – spring system.   (3)
4.   **(c) Answer the following questions on the basis of graph drawn between object distance from lens (p) and image distance from lens (q).**   (4)
  i.   What you conclude from the graph?
  ii.   Find the focal length of lens from the graph.

Good Luck
Ch. Khalid Mahmood Ashraf