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Part I: Say true if the statement is correct and false if the statement is incorrect (1pt each)

T 1. Random Errors can be eliminated by pre-calibrating against a known, trusted standard.

2. The component of vector always larger than the magnitude of the resultant vector.

T 3. If the object accelerates, then the net force acting on system is equal to zero.

F 4. In projectile motion, the vertical velocity is maximum at maximum height (at the peak).

F 5. A planet moves fastest when they are farthest from the sun.

Part II: Give short answer for the following questions (1pt each)

1. _____ is the tendency of an object to resist a change in its state of motion

2. If you drop an object from a height H above the ground, find a formula for the speed with which the object hits the ground_____

Part III: Choose the correct answer among the given alternatives (1.5 pts each)

1. For an object moving in uniform circular motion, the direction of the radial acceleration vector is:

   A. Tangent to the path of the motion

   B. Equal to zero

   C. Directed radially outward

   D. Directed radially inward

2. A brick of mass M placed on a smooth table is:

   A. subject only to the action of its own weight

   B. not exposed to any force

   C. exposed only to the reaction of the table

   D. exposed to its own weight and the reaction of the table

3. A boy can throw a ball maximum horizontal distance of 40m on a level field. How far can be throw the same ball vertically upward?

   A. 40m B. 20m C. 30m D. 10m

4. Which of the following is not correct?

   A. Accuracy measures how close a measured value to the true value.

   B. Precision measures how closely two or measurement agree with each other.

   C. Systematic error can be resulting from measuring device being without calibration.

   D. Random error can be reduced by adjusting a measuring device.

Name: _____

5. Which one correct about frictional force?
   A. Frictional force affected by both surface texture and angle between applied force and surface
   B. Frictional force depends on the area between two surface contacts
   C. Frictional force is directly proportional to weight of an objects.
   D. Frictional force acts parallel to the moving objects.
6. If the distance between the Earth and moon were halved, the force of the attraction between them will be
   A. One fourth as great.
   B. One half as great.
   C. Twice as great.
   D. Four times as great.
7. Which of the following statement about the motion of an object is Not True?
   A. The acceleration of an object moving with constant velocity is zero
   B. The acceleration of an object moving with uniform velocity is constant.
   C. The instantaneous and average velocity of an object moving with constant velocity is equal.
   D. The average velocity and speed of an object gives the detail information of its entire motion
8. In one-dimensional motion, the average speed of an object that moves from one place to another and then back to its original place has which of the following properties?
   A. It is positive B. It is negative C. It is 0 D. It can be positive, negative, or 0
9. Which one of the following sets does **NOT** contain basic physical quantities?
   A. Area, Time, Distance
   B. Mass, Volume, Density
   C. Time, Mass, length
   D. Velocity, Pressure, Power
10. Which one of the following is not unit vector?

   A. $\frac{1}{\sqrt{3}}(\hat{\imath}+\hat{\jmath}+\hat{k})$

   B. $\hat{\imath}+\hat{\jmath}$

   C. $\sin\theta\hat{\imath}+\cos\theta\hat{\jmath}$

   D. $\frac{1}{\sqrt{6}}(\hat{\imath}+2\hat{\jmath}+\hat{k})$

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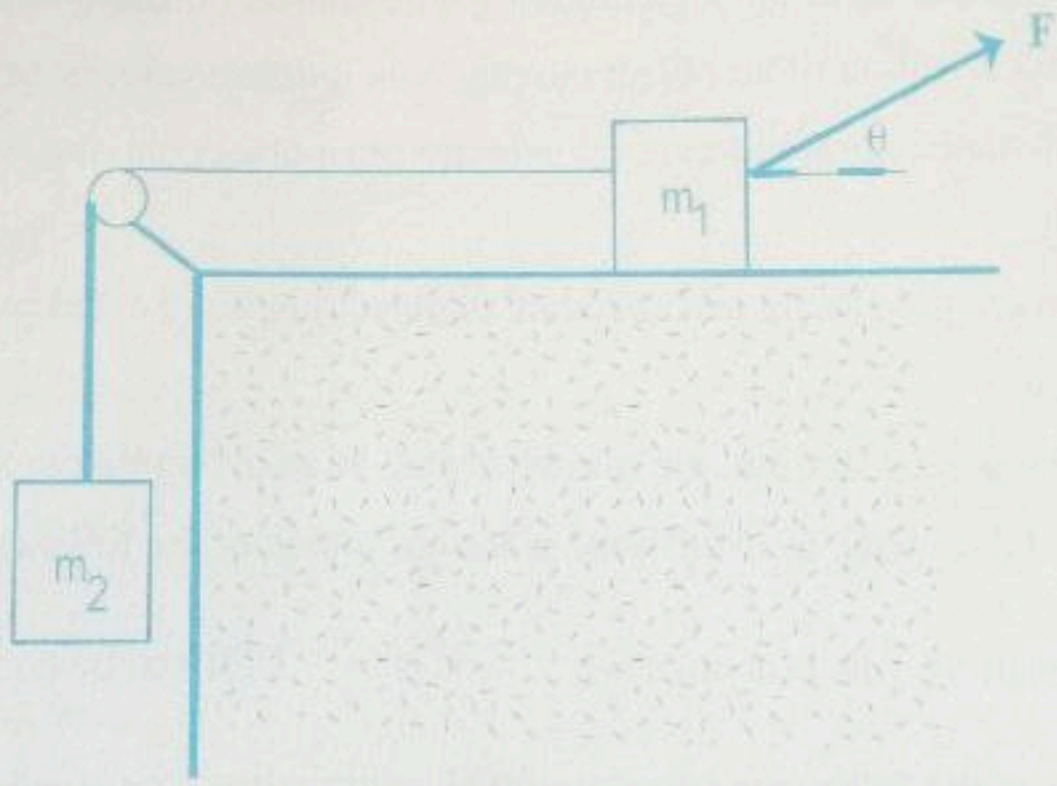
Part IV: Briefly state the following questions (1.5 pts each)

1. Briefly explain the three Newtons laws of motions?
2. State Kepler's laws of planetary motion

Part V: Solve the following problems by showing all the necessary steps (2.5 Pts each)

1. block of mass m_1 on a rough, horizontal surface is connected to a second mass m_2 by a light cord over a light frictionless pulley as shown in the figure. ('Light' means that we can neglect the mass of the cord and the mass of the pulley.) A force of magnitude F is applied to the mass m_1 as shown, such that m_1 moves to the right. The coefficient of kinetic friction between m_1 and the surface is μ. Derive a formula for the acceleration of the masses.



m1 m2

Name: _____

2. A projectile is fired into the air from the top of a 200-m cliff above a valley as shown below. Its initial velocity is 60 m/s at 60° above the horizontal. Calculate (a) the time required to reach its highest point (b) the maximum height, (c) the total time of flight, (d) the components of its velocity just before striking the ground, and (e) the horizontal distance traveled from the base of the cliff.