

**KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF PHYSICS**

**PHYS 133 – FIRST MAJOR EXAMINATION
(TERM 062)**

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Name: _____ **ID #** _____

Show full details of solutions

| Problem # | Grade / 10 | Problem # | Grade / 10 |
|------------------|-------------------|------------------|-------------------|
| 1. | | 7. | |
| 2. | | 8. | |
| 3. | | 9. | |
| 4. | | 10. | |
| 5. | | 11. | |
| 6. | | 12. | |

Total : / 120

Total: / 15

1. If $x = 10 \pm 1$ cm
 $y = 100 \pm 1$ cm

Find z and the uncertainty in z for:

a. $Z = y - x$

b. $Z = \frac{y}{x}$

2. What is the prefix of the following:

- a) 10^9
- b) 10^6
- c) 10^{-2}
- d) 10^{-6}
- e) 10^{-9}

3. Estimate the time in days that will take a person to walk from Jeddah to Damman.

4. A particular car traveling at 100 km/h slows down at a constant 1 m/s^2 .
Find:
- a) The time it takes it to stop
 - b) The distance it travels during the fifth second

5. A falling stone takes 0.2 sec to travel past a window 2.0m tall. From what height above the top of the window did the stone fall?

6. A stone dropped from the top of a building. It hits the ground 3.0 s later. How high is the building?

7. A vector in the xy – plane has a magnitude of 100 units and an x -component of -50 units, knowing the y – component to be positive, find:
- The y – component of the vector
 - The direction of the vector relative to the xy axis.

8. A ball thrown horizontally at 20 m/s from the top of a building, lands 30m from the base of the building. How high is the building?

9. Two blocks of masses 10 kg and 5 kg are connected by a light string that passes over a pulley as shown in the figure find (assume no friction)
- The acceleration of the two objects
 - The tension of the string

10. A box slides down a 30° incline, with an acceleration of 1.2 m/s^2 . Determine the coefficient kinetic friction between the box and the incline.

11. An elevator accelerates upward at 1.5 m/s^2 . If the elevator has a mass of 200 kg, find the tension in the supporting cable.

12. A box was given an initial speed of 120 m on a frozen lake. The box remains on ice and slides 120 m before coming to rest. Determine the coefficient of kinetic friction between the box and the ice.