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FACULTY OF SCIENCE, DEPARTMENT OF PHYSICS
PHY 103- INTRODUCTORY PHYSICS I
TUTORIAL 2

INSTRUCTION: SHOW ALL WORKINGS

1. An automobile of mass 1,200kg has to be given an acceleration of 2.0m/s^2 on a rough surface where the μ of friction is 0.12. Calculate the force needed to accelerate.
   a. 3.8kN b. 4.8kN c. 3.8MN d. 4.8gN
2. Find the vector product of
   $P = -i + 2j - 3k$
   $Q = 3i - 2j + 5k$
3. Pressure is define as _____
4. _____ is done in stretching or compressing the spring.
5. A truck of mass 3000kg travelling 5m/s strikes a sedan stopped at a signal light. The two vehicle stick together. if the mass of the sedan is 2000kg, at what speed does it move immediately after the collision?.
6. Fire fighters sometimes use a ----------fire hose to knock down the door of a burning house.
7. Which surface radiates heat energy best ?
8. A particle of mass $2.5x10^{-6}kg$ revolving around the earth has a radial acceleration of $4x10^{7}ms^{-2}$. What is the centripetal force of the particles?
9. A simple pendulum makes 50 oscillations in one minute. What is its period of oscillation?
10. A grindstone wheel has a constant angular acceleration $\alpha = 0.35rad/s^2$. It start from rest, $\omega_0 = 0$, with an arbitrary reference line horizontal, at an angular position. What is the wheel's angular velocity at t = 18s?
11. A particle describes a circular path of radius 0.45m at the rate of 1200 revolutions per minute.
    Determine its frequency :
12. The length of a simple pendulum is increased by a factor of four. By what factor is its period increased ?
13. A constant force of 20N acts on a body of mass 4kg for 3 s. Determine the change in momentum of the body within this period.
14. Two bodies, each of mass m, moving with the same constant speed v, are are approaching each other on a straight line. Their total kinetic energy, E_k and momentum p are given by
15. The path of the motion of a body undergoing simple harmonic motion is:
16. A resultant force of 15.00N acts for 6.0s on a body of mass 4kg. Calculate the change in momentum of the body within this period.
17. A 5.0kg mass oscillates with an amplitude of 25cm when attached to a spring of force constant 125Nm^{-1}. Find the period
18. The pressure at any point in a liquid at rest depends only on the
19. Why is the ground always cold at night
20. A man standing on a lift that is descending does not feel any weight because

NOTE: IN PREPARATION FOR EXAM- PRACTICE AS MANY QUESTIONS AS YOU CAN, READ YOUR NOTES AND ANY TEXTBOOKS YOU CAN READ ON PHYSICS THEN BE SURE TO EXCEL.