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TAKE HOME EXAMINATION
SCHOOL YEAR 2007 – 2008

SUBJECT : P H Y S I C S
CLASS : X – 1 AND X – 2
DAY / DATE : Saturday, December, 6 th 2008

Questions:

- From the following groups of physical quantities, which is the group of the derived quantities?
 - length, time, velocity
 - velocity, mass, time
 - temperature, time, area
 - weight, length, electric current
 - velocity, weight, volume

- A student uses a vernier caliper to measure the diameter of wooden cylinder. The following figure shows the reading of the vernier caliper scale. What is the reading shown?

- 48.2 mm
- 48.4 mm
- 48.6 mm
- 48.8 mm
- 49.0 mm



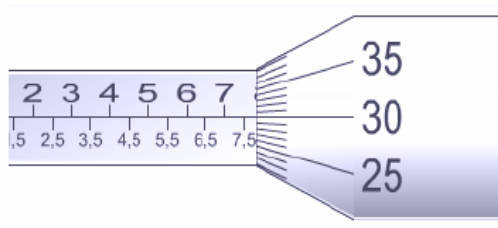
- The figure below shows a wooden cube measured by a vernier caliper. What is the width of the cube as read in the scale?

- 58,1 mm
- 58,3 mm
- 58,5 mm
- 58,7 mm
- 58,9 mm



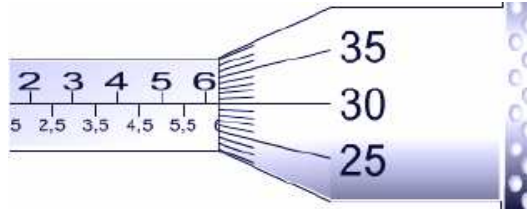
4. The following figure illustrates a micrometer screw gauge. What is the reading shown?

- a. 73 mm
- b. 75 mm
- c. 78 mm
- d. 80 mm
- e. 81 mm



5. The following figure illustrates a micrometer screw gauge. The reading of the micrometer below can be reported as ...

- a. 63 mm
- b. 69 mm
- c. 73 mm
- d. 83 mm
- e. 90 mm



6. The dimension of energy is

- a. MLT^{-1}
- b. ML^2T^{-3}
- c. ML^2T^{-1}
- d. ML^2T^{-2}
- e. $M^{-1}L^3T^{-2}$

7. The dimension of pressure is

- a. ML^3T^{-2}
- b. ML^2T^{-2}
- c. $ML^{-2}T^{-2}$
- d. $ML^{-2}T^{-3}$
- e. $ML^{-1}T^{-2}$

8. Bernoulli equation can be write $P + \rho \cdot g \cdot h + \frac{1}{2} \rho \cdot v^2 = C$. Dimension of C is

- a. $[MLT^{-1}]$
- b. $[MLT^{-2}]$
- c. $[ML^{-1}T^{-2}]$
- d. $[ML^2T^{-2}]$
- e. $[ML^2T^{-3}]$

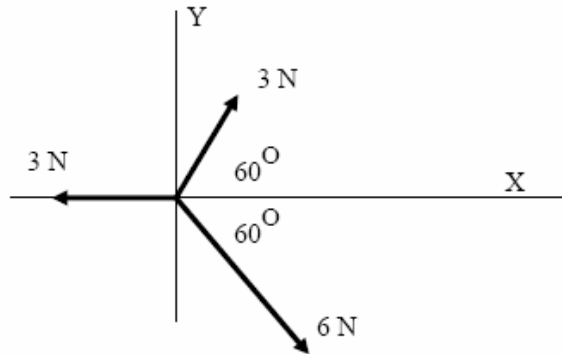
9. Two force vectors, have the magnitudes $A = 5$ newtons and $B = 8$ newtons, with the angle between = 60 degree one another. What is magnitude $A - B$

- a. 3 newtons
- b. 5 newtons
- c. 7 newtons
- d. 129 newtons
- e. 13 newtons

10. A swimmer can swim at a speed of 0.8 m/s with respect to the water. She wants to cross a river which is 40 m wide and has a current of 0.6 m/s. If the direction of her swimming is perpendicular to the water's flow, how far will she be when she lands on the other bank?
- 100 m
 - 90 m
 - 80 m
 - 60 m
 - 50 m

11. Take a look at the diagram of forces bellow. The resultant of the three force is ...

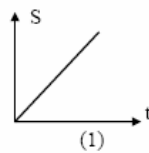
- 2.0 Newton
- 3 2 Newton
- 3.0 Newton
- 3 3 Newton
- 3 4 Newton



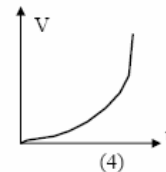
12. The following graphs are the graph of displacement (S) or velocity (V) versus the time (t) of the rectilinear motion.

From the graphs above, which is the graph of rectilinear motion with constant acceleration?

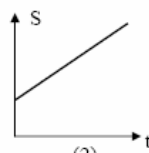
- graph 1
- graph 2
- graph 3
- graph 4
- graph 5



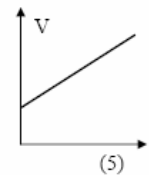
(1)



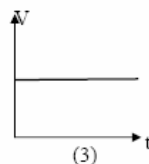
(4)



(2)



(5)



(3)

13. Motor cycle moves from rest with uniform acceleration 4 m/s^2 . What is the distance travelled motor cycle in 10 minutes.

- 120 km
- 360 km
- 420 km
- 600 km
- 720 km

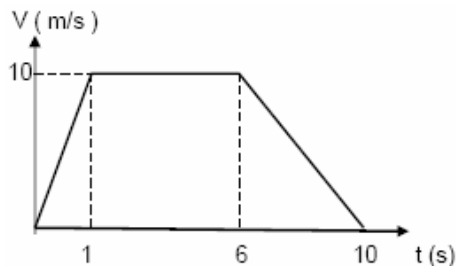
14. A 400 grams body starting from rest falls through a vertical distance of 60 cm to the ground. What is the velocity of the body just before it hits the ground?

- 2 m/s
- $3\sqrt{2}$ m/s
- $2\sqrt{3}$ m/s
- 4 m/s
- 5 m/s

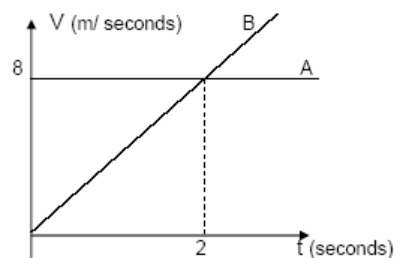
15. Someone falls a stone from peak of tower with initial velocity 4 m/s. if $g = 10 \text{ m/s}^2$ and time required to reach the earth 3 seconds, what is height peak of tower?
- 57 meters
 - 63 meters
 - 75 meters
 - 80 meters
 - 92 meters

16. The velocity – time graph for Nova on a cycle ride is shown in figure. How far did she travel?

- 60 meters
- 65 meters
- 70 meters
- 75 meters
- 80 meters



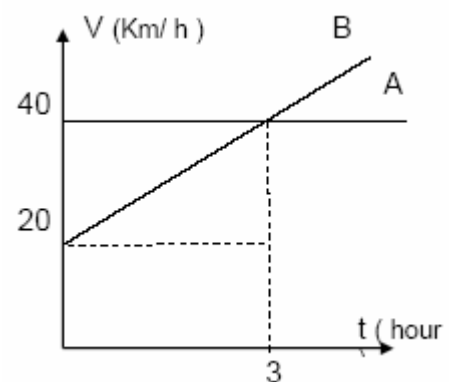
17. The graph in figure above shows the speed of two cars A and B which are travelling in the same direction. Car A travelling at a constant speed of 8 m/s, overtakes car B at time $t = 0$, In order to catch up with car A.



What additional time will it take for car B to catch up with car A?

- 2 seconds
- 4 seconds
- 6 seconds
- 8 seconds
- 10 seconds

18. The graph in figure beside shows the speed of two cars A and B which are traveling in the same direction. Car A traveling at a constant speed of 40 km/h, overtakes car B at time $t = 0$, In order to catch up with car A. What additional



- 1,3 hour
- 1,5 hour
- 3,0 hour
- 4,5 hour
- 6,0 hour

19. By using a centripetal tool, the object of mass m rotates with constant angular speed of ω . If string's length of the centripetal tool is started to $\frac{1}{4}$ times, the angular speed become
- 4ω
 - 2ω
 - 1ω
 - 0.5ω
 - 0.25ω
20. A particle moves of a circular path with radius 0,5 meters had kinetic energy 5 Joules
What is centripetal force of particle?
- 10 newtons
 - 20 newtons
 - 30 newtons
 - 40 newtons
 - 50 newtons
21. An object mass 2 Kg moves in a vertical circular motion, radius of path 0.5 meters. angular velocity 6 rad/s and acceleration of gravity (g)= 10 m/s², Determine the magnitude centripetal of force
- 16 newtons
 - 36 newtons
 - 56 newtons
 - 124 newtons
 - 144 newtons
22. Free fall motion is a body moving with ...
- Uniform motion
 - Uniform deceleration
 - Uniform acceleration
 - Parabolic motion
 - Unknow motion
23. An object mass 5 Kg falls freely (without air resistance) from a tower of 15 meters. If $g = 10 \text{ m/s}^2$. Determine the kinetic energy if the height an object 3 meters from the earth...
- 150 joule
 - 200 joule
 - 300 joule
 - 450 joule
 - 600 joule
24. If an object given by force 40 N the acceleration $2 \text{ m} / \text{s}^2$. What is the acceleration if an bject given by forces 90 N.?
- 2.5 m/s^2
 - 3.5 m/s^2
 - 4.5 m/s^2
 - 5.5 m/s^2
 - 6.5 m/s^2

25. Someone reside in lift which in motion. If the people weight impressing more and more bigly, hence can be concluded by lift motion
- go down with acceleration remain to
 - go down with speed remain to
 - go up with speed remain to
 - go up with acceleration remain to
 - go down with acceleration remain to, later then desist

26. In circular motion, the relationship v , ω , R can be expressed by the equation as follows

a. $v = \frac{\omega}{R}$

d. $v = \frac{R}{\omega}$

b. $v = \omega R$

e. $\omega = vR$

c. $\omega = \frac{R}{v}$

27. In uniform circular motion can be expressed

- the magnitude centripetal of force is constant
- momentum is constant
- kinetic energy is constant
- the magnitude centripetal of acceleration is constant

The correct statement is ..

- (1), (2), and (3)
 - (1) and (3)
 - (2) and (4)
 - only (4)
 - (1), (2), (3), and (4)
28. A particle moves in a circular path with radius R , the centripetal of force F_0 . If the kinetic energy is constant and radius of path changes to $2R$, what is the magnitude centripetal of force now?
- $\frac{1}{4} F_0$
 - $\frac{1}{2} F_0$
 - $1 F_0$
 - $2 F_0$
 - $4 F_0$
29. An object mass 0.3 Kg bound at the end of string moves in a vertical ircularmotion, radius of path 0.6 meters . angular velocity 10 rad/s and acceleration of gravity (g) = 10 m/s^2 , Determine the minimal tension of string

- a. 15 newton
- b. 20 newton
- c. 30 newton
- d. 45 newton
- e. 60 newton

30. A bus traveling north along a straight road at 72 km/h slows down uniformly and takes 5.0 s to stop. Calculate the total distance when the bus traveling in meters
- a. 15 meters
 - b. 20 meters
 - c. 30 meters
 - d. 50 meters
 - e. 60 meters

II. Essay

31. A sports car, accelerating from rest, was timed over 400 m and was found to reach a speed of 120 km/h in 18.0 s.
- a. What was the average speed of the car in m /s?
 - b. Calculate the average acceleration of the car in km/h²?
 - c. What was its average acceleration in m/s²?
 - d. If the driver of the car had a reaction time of 0.60 s, how far would the car travel while the driver was reacting to apply the brakes at this speed of 120 km/h?
32. A snowboarder in a race is traveling at 10 m/s as she crosses the finishing line. She then decelerates uniformly until coming to rest over a distance of 20 m.
- a. What is her acceleration as she pulls up?
 - b. How long does she take to come to rest?
 - c. Calculate the average speed of the snowboarder as she pulls up.
33. A car starts from rest and accelerates uniformly for 8.0 s. It reaches a final speed of 16m/s.
- a. What is the acceleration of the car?
 - b. What is the average velocity of the car?
 - c. Calculate the distance traveled by the car.
34. A cyclist, whilst overtaking another bike, increases his speed uniformly from 4.2 m/s to 6.3 m/s over a time interval of 5.3 s.
- a. Calculate the acceleration of the cyclist during this time.
 - b. How far does the cyclist travel whilst overtaking?
35. A car traveling with a constant speed of 80 km/h passes a stationary motorcycle policeman. The policeman sets off in pursuit, accelerating to 80 km/h in 10.0 s and reaching a constant speed of 100 km/h after a further 5.0 s. At what time will the policeman catch up with the car?