



EXAM 2nd TERM
22nd of March 2017



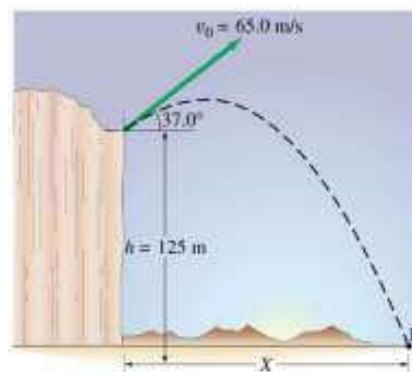
Name: N^o: 1^o BAC-

1. (1 point). A rock has a position vector given by: $\vec{r} = 2 \cdot t \vec{i} + (20 \cdot t - 5 \cdot t^2) \vec{j}$ (S.I). Calculate the average velocity vector and its unit vector during the time interval $t = 3$ s to $t = 8$ s. Determine the equation of the trajectory.

2. (1.5 points). Two cars are 6310 m apart and traveling towards each other on the same road. Car A, accelerates from rest at 0.5 m/s^2 . Car B has a constant velocity of 90 km/h. a) When do the cars pass by each other? b) Where are the cars when they pass by each other? c) How fast is each car traveling when they pass by each other?

3. (2 points). A ball is thrown vertically upwards with an initial velocity of 50 m/s from a point that is 150 m above the ground. a) What is the maximum height above the ground that this ball will rise to? b) how long will it take for the ball to hit the ground? c) With what velocity will the ball impact the ground? d) When will the ball be 250 m above the ground?

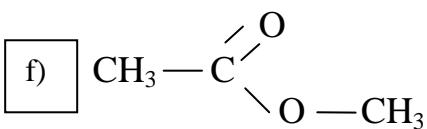
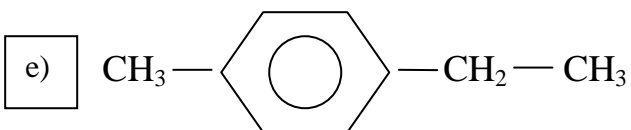
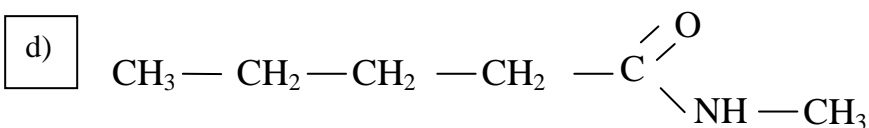
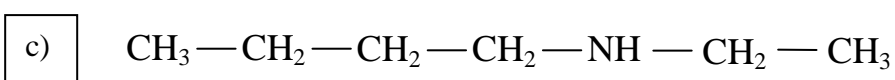
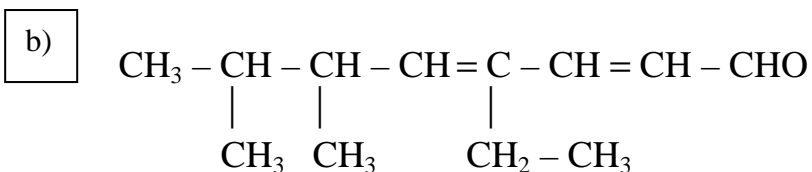
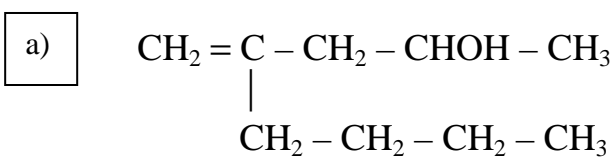
4. (2.25 points). An object is fired with a speed of 65.0 m/s from a point that is 125 m above the ground, at an angle of 37° above the horizontal. a) Write the position and velocity vectors for the object. b) Find the horizontal distance it travels. c) What is the maximum height above the ground that the object will rise to? d) How far has the object traveled (horizontally) when it is 160 m above the ground?



5. (1.5 points). A car goes around a circumference of radius 50 m at a constant speed of 36 km/h. Calculate: a) The time required to complete a cycle of motion. b) Through what distance and angle (degrees) does the car move in 10 s? How many revolutions does it make in 15 minutes?

6. (1.5 points). A particle moves in simple harmonic motion with a frequency of 3 oscillations per second and an amplitude of 15 cm. The oscillation starts ($t = 0$) when the displacement has its maximum positive value ($y = +A$). Find: a) The equation of displacement for this motion, $y(t)$. b) The displacement (y) when the velocity of the particle is 2.1 m/s. c) What is its maximum speed? Where does that occur?

7 (1.5 points). I) Write the name for each compound.



II) Write the *formula* for each compound.

a) 2,4-heptadiene

b) 1,4-dibromohexane

c) 2-ethyl-2,6-dimethyl-3-heptenoic acid

d) Butyl methyl ether

e) 2,5-dimethyl-2-propyl-3-heptyn-1,5-diol

f) 3-ethyl-2,6-nonadienenitrile

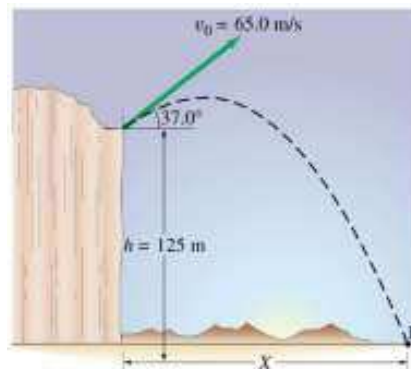
Nome: Nº: 1º BAC-

1. (1 punto). Unha pedra ten un vector de posición dado por: $\vec{r} = 2 \cdot t \vec{i} + (20 \cdot t - 5 \cdot t^2) \vec{j}$ (S.I). Calcula o vector velocidade media e o seu vector unitario durante o intervalo de tempo que vai desde $t = 3 \text{ s}$ a $t = 8 \text{ s}$. Determina a ecuación da traxectoria.

2. (1,5 puntos). Dous coches separados por 6310 m viaxan na mesma estrada en sentidos contrarios. O coche A acelera a $0,5 \text{ m/s}^2$, partindo do repouso. O coche B ten unha velocidade constante de 90 km/h. a) Cando se cruzarán? b) Cal é a distancia percorrida por cada coche nese momento? c) Cal é a velocidade de cada coche no momento do cruce?

3. (2 puntos). Lánzase un pelota verticalmente cara arriba desde un punto situado a 150 m sobre o chan cunha velocidade de 50 m/s. a) Cal é a máxima altura acadada pola pelota sobre o chan? b) Cando chegará ao chan? c) Con que velocidade impactará a pelota no chan? d) Cando estará a 250 m sobre o chan?

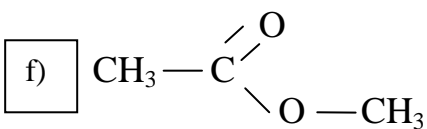
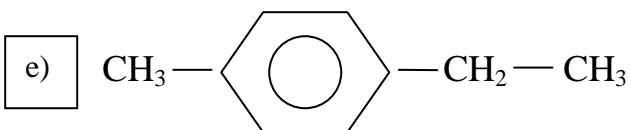
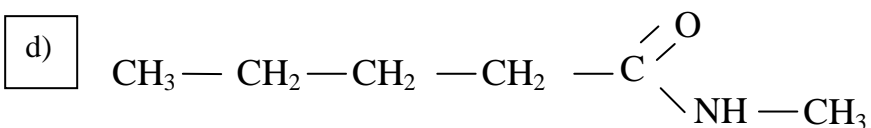
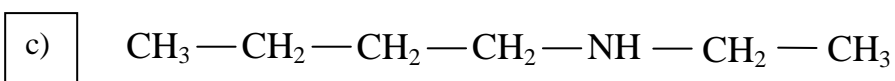
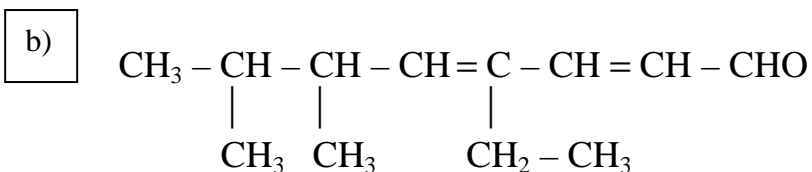
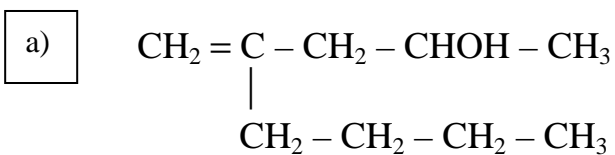
4. (2,25 puntos). Dispárase un obxecto cunha velocidade de 65.0 m/s desde un punto situado a 125 m sobre o chan cun ángulo de 37° con respecto á horizontal. a) Escribe os vectores de posición e velocidade en función do tempo. b) Cal é a distancia horizontal percorrida ata que volve a tocar o chan? c) Cal é a máxima altura acadada polo obxecto? d) Cal é a distancia horizontal percorrida polo obxecto cando está a 160 m sobre o chan?



5. (1,5 puntos). Un coche traça unha circunferencia de 50 m de radio cun módulo da velocidade constante de 36 km/h. Calcular: a) O tempo que lle leva en completar unha volta. b) Espacio percorrido e ángulo descrito polo coche en 10 s. c) Cantas voltas dá en 15 minutos?

6. (1,5 puntos). Unha partícula móvese describindo un movemento harmónico simple con unha frecuencia de 3 oscilacións por segundo e unha amplitude de 15 cm. O corpo comeza a oscilar ($t = 0$) cando a elongación é máxima ($y = + A$). Calcula: a) A ecuación do movemento, $y(t)$. b) A elongación (y) cando a velocidade da partícula é de 2,1 m/s. c) Cal é a velocidade máxima? Onde ocorre?

7 (1,5 puntos). I) Escribe o nome de cada composto.



II) Escribe a fórmula para cada composto:

a) 2,4-heptadieno

b) 1,4-dibromohexano

c) Ácido 2-etil-2,6-dimetil-3-heptenoico

d) Butil metil éter

e) 2-propil-2,5-dimetil-3-heptin-1,5-diol

f) 3-etil-2,6-nonadienonitrilo