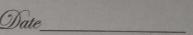
Date (c) v(x) = 1 v Q3(a) E=KE + P.E E = 1 (mv2+ kx2) V = 0.154 Vmax = 1 (0.154) E= 372 × 0.042 = 0.02J (b) K. Emax = E 21 = 2 V= 0154 ms Qu(a) PE=1 KA2 KE= 1 mv2 V= JkA2 (c) A= | 2km (b) W= | k Q5: m= 2kg 2=10 n= - 2m sin (wt + 4) -7.5= 10 sin (\$) \$ = 48.59 $\omega = \frac{2\pi}{T} = \frac{2\pi}{0.2} = 31.41$ w= fu

u= 31.4152 x 2

h= 1973.92



Date Vmax = W21m = 314.15 aman = w2 um = 9869.02 T.E = 1 mw2 km2 T.E = 98690.22 26t) = 10 sin (31.45t - 48.59) Q6: No rectoring force of spring. The system will be overdamped and will not oscillate. $Q_7(a)$ $T = 2\pi L = 2\pi 2.23 = 35$ (b) ET = 1 mv2 = 1 (6.74)(2.06) = 14.3] = mg (L-L cos 0) = mg L(1- cos 0) COSO = 1-ET 0 max = 0.443

ODate . Q8: amen = µ9 = 3.92m Gires: 21 max = m1+m2 = 22cm P9: angle = \$ = cut n = Acas \$0 n= Acos wt 21= Acas (+ 4) PIO. Energy of pendulum E1= 1 kA2 = 45j - i Ez= 1 L 42 = 15j - 1i Damped: Amp: A(t) = A0e -bt/2 = cos(wt + p) be damp constant

| | Date |
|---|---|
| A1 = ebt/2m A2 | (8+ Ment Lead States |
| | 18 Files Valley and The Bally |
| 15b - (n/Ai) 2m An) | |
| 2- (A) | |
| $\frac{b}{m} = \frac{2 \ln 3}{15}$ | (chart) and a filter |
| Q11. $E(t) = E(0) \times e^{(-bt/2n)}$ $E(t) = \frac{1}{2} \times F(0)$ | -) |
| $\frac{1}{2} \times E(0) = E(0) \times e$ | |
| 1 = -bt/2m | |
| | Para to the total and the second |
| ln 1 = ln e-b+/2m | Twist-sect smill |
| | (8+++1111111111111111111111111111111111 |
| $t = \left(-\frac{2m}{\ln(1/2)}\right) \times \ln\left(\frac{1}{2}\right)$ $t = \left(-\frac{2\times2}{\ln(1/2)}\right) \times \ln\left(\frac{1}{2}\right)$ | 1/25) |
| | |
| t=-1.8587s | |
| | |
| | |
| | |
| | |
| | |
| | |
| | io. |

ODate. Q12. 21(t)= Acos(w++0) v(t) = - v max sin (w++0) A = V max 21. (t) = Vman cos (wti) 212 (tr) = van cos (wt2) $v_1(t) = -v_{man} \sin(\omega t_1)$ $v_2(t) = -v_{man} \sin(\omega t_2)$ Vmau2 = V,2 + 212. W2 Vman 2 = V2 + 212 . W2 Vman = 102.1 cms $\mathcal{D}^{3} \approx A\cos(\omega t + \theta)$ $\mathcal{D}_{\mathcal{U}}(\theta) = 0 \Rightarrow \theta = \pm \frac{\pi}{2}$ -TZ W = 27 = 77 = 72 21= Acos (TL + -12) = A sin (71, +) us Asin (t) 0.06 = 0.10 sin Tet t=0.6scconds.