

الإمتحان النهائي خريف 2022	كلية الهندسة - جامعة مصراتة
التاريخ: 2023/02/11 ف	إسم المقرر: اهتزازات ميكانيكية 1 رقم المقرر: هـ مك 409
الزمن: ساعتان و نصف	القسم: الهندسة الميكانيكية

1. An accelerometer indicates that a structure is vibrating harmonically at 82 cps with a $a_{max} = 50g$ maximum acceleration of 50 g. Determine the amplitude of vibration?

ف
 $f = 82 \text{ cps}$
 $a_{max} = 50g = 1.94 \times 10^{-3}$
 ف
 V_{max}

2. A harmonic motion has a frequency of 10 cps and its maximum velocity is 4.57 m/s. Determine its amplitude, its period, and its maximum acceleration?

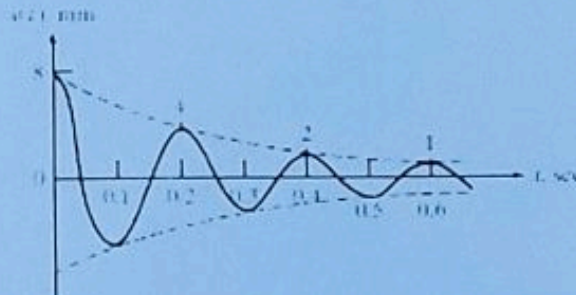
ف
 $f = 10 \text{ cps}$
 $V_{max} = 4.57 \text{ m/s}$
 $a_{max} = 284.22$
 ف
 عدد الاهتزازات
 من الزمن
 سرعة الاهتزاز

3. The free-vibration responses of an electric motor of weight 500 N mounted on different types of foundations are shown in Figs. (a) and (b). Identify the following:

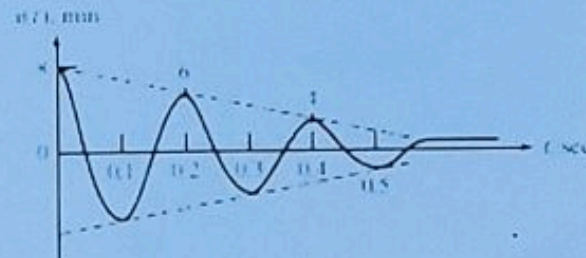
(i) the nature of damping provided by the foundation in each case

(ii) the spring constant and damping coefficient of the foundation in case (a)

(iii) the undamped and damped natural frequencies of the electric motor in case (a)



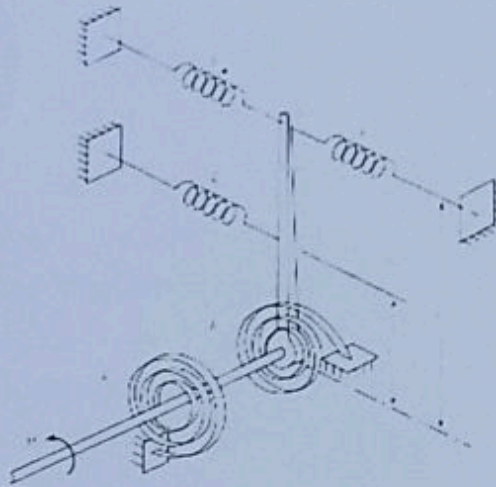
(a)



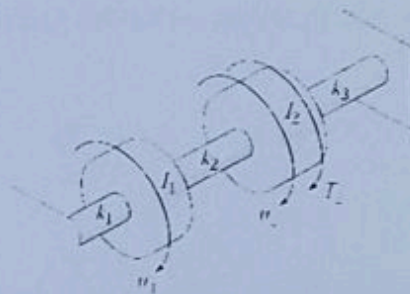
(b)

0.2876

4. In the figure below, find the equivalent spring constant of the system in the direction of θ .



5. In the figure below model the three shafts as massless torsional springs. When $\theta_1 = \theta_2 = 0$ the springs are at their free lengths. Derive the equations of motion with the torque T_2 as the input.



انتهت الأسئلة