

الإمتحان النهائي خريف 2022	كلية الهندسة - جامعة مصراتة
التاريخ: 2023/02/11 ف	إسم المقرر: اهتزازات ميكانيكية I 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?

الذبذبة

10.54/s

$$1.84 \times 10^{-3}$$

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?

284.22

الزمن

السرعة

$$284.22$$

a_{max}

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

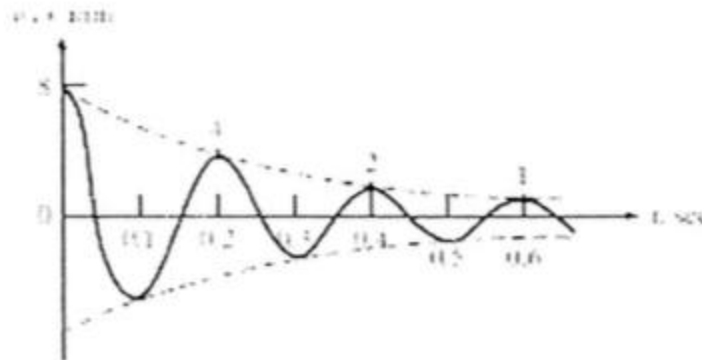
مبدد الاهتزاز

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

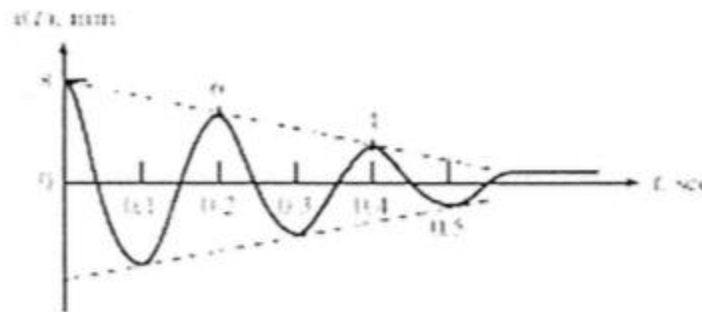
k_{eq}

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

ω_n ω_d



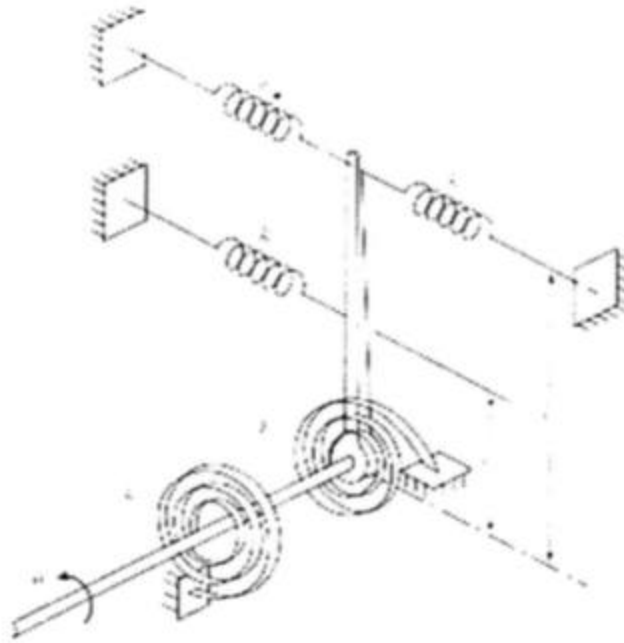
(a)



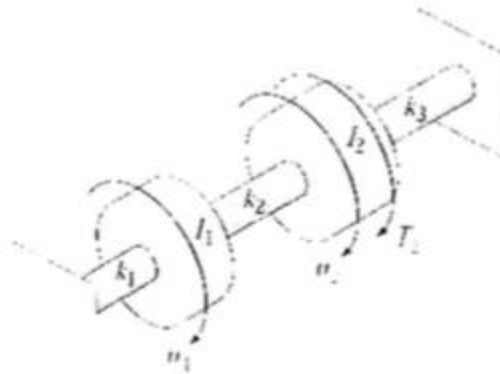
(b)

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