NOTE: The exam will have many more questions than these examples.

5 Points Each, *Circle the best answer*

Assume a fluid with mass density of ρ =2000 kg/m³ and compressibility of κ =10⁻⁶ Pa⁻¹ for the questions below.

- 1. The phase velocity of a 1 kHz acoustic wave in the fluid in m/s is v_p =
 - a) 200
- b) 500
- c) 1000
- d) 2000 (e) none above

- 2. The wavelength of a 1 kHz acoustic wave in the fluid is λ =
 - a) 0.01 m
- b) 0.5 m
- c) 1 m
- d) 2 m

e) none above

 $e = \frac{22.4}{1000} = 0.0224 \text{ m}$

- 3. The wavenumber, or spatial frequency, of a 1 kHz acoustic wave in the fluid in rad/m is β =
 - a) 0.12
- b) 2.2
- c) 4.3
- d) 12.6
- e) none above

B= ZII = ZII = Z81 (A)

- 4. The characteristic impedance of a 1 kHz acoustic wave in the fluid in N s/m³ is Z₀=
 - a) 2000
- b) 5000
- c) 8000
- d) 10⁴
- e) none above

12000 = 44,700 NS/M3

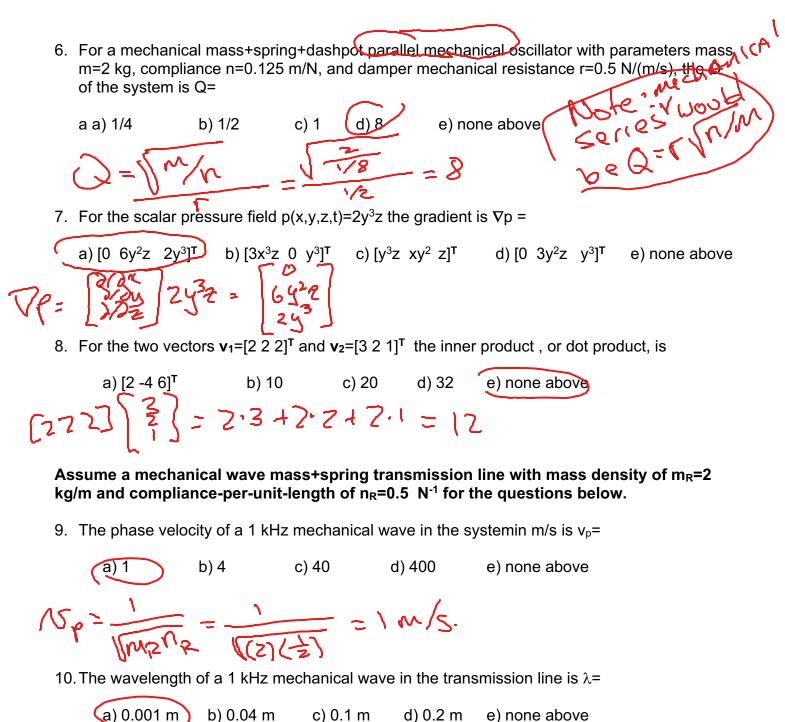
- 5. A valid pressure plane wave in the fluid would be $p(x,y,z,t)=[1\ 0\ 0]^T\ e^{-j12.6z}\ e^{-j2000\pi t}$
 - a) True

b) False

-JMJST EQUAL 6-JEVERKZ

WYRKR = 120007 V(2000)(106) = 281

Note



Assume a 2 m longpiston of 0.001 m² area is filled with fluid with mass density of ρ =4 kg/m³ and compressibility of κ =10⁻⁶ Pa⁻¹ for the questions below.

11. The piston is equivalent to a spring with compliance in m/N of n=

= - 0,001 m

- a) 0.001
- b) 0.004 m
- c) 0.04
- d) 0.02

e) none above

 $N \rightleftharpoons \frac{kl}{A} = \frac{(10^6)(2)}{0.001} = 0.002 \frac{m}{2}$