



School/Faculty: NALPI	Department/Year: ALU/Year 1	Lecturer(s): Prof. GEH Wilson E.
Course Code: PHVE2101	Course Title: Engineering Physics I	Course Credits: 4
Date: 31/01/2020	Hall:	Time: 1hr30 mins
Instructions: Answers All questions in Section A and Section B		

First Semester Examinations 2019/2020

Section A: write only the letter which corresponds to the correct Answer.

1. The energy of a particle moving in simple harmonic motion with amplitude A is:

- A) $\frac{m\omega A^2}{2}$ B) $\frac{m\omega^2 A^2}{2}$ C) $\frac{m\omega A^2}{2}$ D) $\frac{m\omega^2 A^2}{2}$

2. Which of the following is not a property of electromagnetic (EM) waves?

- A) EM waves can be Polarized B) have momentum C) exhibit diffraction D) are longitudinal
 Which of the following is not a characteristic of the vibrating particles in a progressive wave?
 A) Particles have same frequency B) particles have same amplitude
 C) Particles have different frequencies D) Particles are out of phase with each other

3. A wave is an,

- A) energy carrying disturbance stationary in a medium
 B) energy and momentum carrying disturbance propagated through a medium
 C) momentum carrying disturbance propagated through a medium
 D) a disturbance that transfer energy through matter no mass transport.

Questions 5 – 11 is based on the following.

4. A) shock wave B) progressive wave C) harmonic wave D) standing wave E) matter waves

5. Friction in electrons and particles

6. There is continual interchange of kinetic and potential energy.

7. Example of a periodic wave.

8. Example of non-periodic wave.

9. A wave whose wave profile moves along with the wave speed.

10. Can be transverse or longitudinal.

11. shows no net energy transfer.

12. The power of the wave mass with per unit length ρ and length λ is given as

- A) $\frac{1}{2} \frac{\rho \lambda \omega^2 A^2}{T}$ B) $\frac{1}{2} \rho c \omega A^2$ C) $\rho c \omega^2 A^2$ D) $\frac{\rho \lambda \omega^2 A^2}{T}$

13. When two points are out of phase their path difference is:

- A) $\left(\frac{n+\lambda}{2}\right)$ B) $\left(n\lambda + \frac{\lambda}{2}\right)$ C) $\left(n + \frac{\lambda}{2}\right)$ D) $n\lambda$

Question 14-19 is based on the following:

A plane progressive wave is represented by the following equation $y = 0.2 \sin\left(100\pi t - \frac{40\pi x}{17}\right)$

14. The frequency of the wave is: A) 50Hz B) 200Hz C) 100Hz D) 614Hz

15. The wavelength of the wave is: A) 1.7m B) 17m C) 0.85m D) 85m

16. The speed of the wave is: A) 170m/s B) 42.5m/s C) 140m/s D) 85m/s

17. What is the phase difference between two points which are 0.85m apart?

- A) 6.28 rad B) 2.77 rad C) 31.2 rads D) 3.14 rads

18. What will be the phase difference between two points which are 0.85m apart but with twice the amplitude and twice the frequency?

- A) 12.56 rad B) 5.54 rad C) 12.56 rad D) 62.4rad

19. The wave equation for a wave moving in the -x direction is:

- A) $y = A \sin(\omega t - kx)$ B) $y = A \sin(2\pi\omega t + kx)$
 C) $y = A \sin(\omega t + kx)$ D) $y = A \sin(2\pi\omega t - kx)$

20. Intensity is measured in: A) B B) dB C) DB D) Bd.

Questions 21-26

Choose from the list A to E below, the wave property, which is best related to each of the phrases that follow.

- A) Polarisation B) Reflection C) Diffraction D) Refraction E) Interference
 1. prevents the formation of shadows with perfectly sharp edges.
 2. is sometimes accompanied by a phase change of pi radians.
 3. can not be exhibited by longitudinal waves.
 4. will cause a change in wave length.
 5. can be used to explain the formation of rainbow.
 6. can be used to explain the stereo effect caused by two speaker placed some distance apart.