

Daffodil International University

**Department of Computer Science and Engineering**

**Faculty of Science & Information Technology**

**Midterm Exam Examination, Summer 2021 @ DIU Blended Learning Center**

**Course Code: PHY113 (Day), Course Title: Basic Physics**

**Level: 1 Term: 1 Section: AC-C**

**Instructor: MMI Modality: Open Book Exam**

**Date: Saturday 17 July, 2021 Time: 09:00am-11:30am**

 **Two and half hours (2:30), Marks: 25**

 **SET-A**

**Answer to the following questions: 10\*1=10**

1. How are inertia and mass related?
2. Many automobile passengers have suffered neck injuries when struck by cars from behind. How does Newton's law of inertia apply here?
3. Why is it easier to walk on a carpeted floor than on a smooth, polished floor?
4. Arrange the items in order of increasing inertia: Bicycle, buss, train, car, scooter.
5. What is the cause of refraction of light?
6. Why is monochromatic light used in the double slit experiment? What would happen if white light were used?
7. Circular water waves decrease in amplitude as they move away from where a rock is dropped. Explain why.
8. Does a gas do any work when it expands adiabatically?
9. Why does a bicycle pump feel warm as you inflate your tire?
10. On a cold winter morning, why does the metal body feel colder than the wood?

 **SET-B**

**Answer to the following mathematical problems: 5\*2=10**

1. The horizontal range of a projectile is 89.5m and the time of flight is 6.3s. Find the velocity and angle of projection.
2. The efficiency of a Carnot engine is 60% when the sink temperature is 370c, what is the change in temperature of source to make its efficiency 80%?
3. The equation of a progressive transverse wave in a string is y=90 sin π (20t -0.1x), here y and x are in meter and t is expressed in second. Find i) amplitude; ii) wavelength; iii) frequency; and iv) wave velocity.
4. Y= 0.5 sin π (100t- x/3.4) is an equation of a progressive wave. Here x and y are expressed in centimeter. Find angular frequency, time period, and velocity of the wave.
5. In Young’s experiment the separation between the slits is 0.4mm. The fringes were seen on a screen kept at 1m away parallel to the slits. The distance of the 12th fringe from the central maxima is 9. 3mm.Find the wavelength of the light used.

 **SET-C**

**Answer to the following questions: 5\*1=5**

1. An object can still run with non-zero velocity event the net force acting on the body is zero

a) True b) false

1. On calculating which of the following quantities, the mass of the body has an effect in simple projectile motion?
a) Velocity b) Force c) Time of flight d) Range
2. At what angle of projectile (θ) is the horizontal range minimum?
a) θ = 45° b) θ = 60° c) θ = 90° d) θ = 75°
3. Which of-the following is not a property of light?
(a) It can travel through vacuum (b) It has a finite speed (c) It requires a material medium for its propagation (d) It involve transportation energy
4. Which of the following is correct for the net entropy change in an irreversible process?

(a) It is positive (b) It is negative (c) It is zero (d) All of the above