St John Baptist De La Salle Catholic School, Addis Ababa

Grade 11 Physics Midterm Examination

1st Quarter

October, 2023

Notes, and use of other aids is **NOT** allowed. Read all directions carefully and **write your answers in the answer sheet**. To receive full credit, you must show all of your work.

Name:_____ Roll Number:_____ Section:___Time Allowed: **40 minutes**

Multiple Choice Questions

1. Which of the following passwords would be computationally secure?
   A. A three digit number B. A 40 digit alphanumeric password
   C. A one digit number D. The password 'password'

2. Which of the following steps in the scientific process comes later compared to the others?
   A. Hypothesizing B. Questioning C. Analysis D. Experimentation

3. Which of the following fields of physics was a topic of the Nobel Prize in Physics this year?
   A. Quantum Optics B. Astronomy C. High energy physics D. Biophysics

4. Let $\vec{C} = \vec{A} + \vec{B}$. In which of the following conditions is $|\vec{C}|$ maximum?
   A. $\vec{A} \parallel \vec{B}$ B. $\vec{A} \perp \vec{B}$ C. $\vec{A} = \vec{B}$ D. None of the above

5. If the vector $6\hat{i} - 4\hat{j}$ starts at the point $P = (-2, 5, -1)$, at what point does it end?
   A. (-4,1,1) B. (4,-1,1) C. (4,1,-1) D. (-4,-1,-1)

6. Which of the following vectors are parallel?
   A. $\vec{v} = 9\hat{i} - 6\hat{j} - 24\hat{k}$ and $\vec{w} = -15\hat{i} + 10\hat{j} + 40\hat{k}$ B. $\hat{i} + \hat{j}$ and $\hat{j} + \hat{k}$
   C. $2\hat{i}$ and $4\hat{k}$ D. None of the above

7. Let $\vec{u} = 8\vec{i} - \vec{j} + 3\vec{k}$ and $\vec{v} = 7\vec{j} - 4\vec{k}$. Which of the following is equal to $|-9\vec{v} - 2\vec{u}|$?
   A. $\sqrt{2893}$ B. $\sqrt{4877}$ C. 26 D. 90

8. If the magnitude of $|\vec{A} + \vec{B}|$ is equal to the magnitude of $|\vec{A} - \vec{B}|$, what is the angle between $\vec{A}$ and $\vec{B}$?
   A. $\frac{\pi}{6}$ B. $\frac{\pi}{4}$ C. $\frac{\pi}{3}$ D. $\frac{\pi}{2}$

Workout Problems

9. Calculate the ratio of the highest to lowest frequencies of electromagnetic waves the eye can see, given the wavelength range of visible light is from 450 nm to 760 nm. Would we be able to observe and study human cells which have an average diameter of about $100\mu m$? Why?

Answer Sheet

1._____	6._____	11._____
2._____	7._____	12._____
3._____	8._____	13._____
4._____	9._____	14._____
5._____	10._____	15._____