11 Physics

Name: _____

Roll #: | | | | | | |

T1 chap1,2,3. 21/04/2020

Time: 2h-40min; Marks: 85

Wasim Tahir physics center

Q1) Choose the most appropriate option. Cutting / overwriting is not allowed: 17 Marks

i) Two vectors to be combined have magnitudes 60N and 35N. The correct answer will be ____

A) 15N B) 20N C) 70N D) 100N

ii) Position vector of a point P (a, b, c) in YZ plane is given by ____

A) $\vec{r} = ai + bj$ B) $\vec{r} = ai + ck$ C) $\vec{r} = ai + bj + ck$ D) $\vec{r} = bj + ck$

iii) When the body moves with constant acceleration, the velocity time graph is ____

A) Parabola B) Hyperbola C) Straight line D) Curve

iv) The dimensional unit of impulse is ____

A) MLT B) MLT^{-1} C) $ML^{-1}T^{-1}$ D) $M^{-1}L^{-1}T^{-1}$

v) The S.I. unit of solid angle is _____

A) degree B) steradian C) revolution D) radian

vi) The horizontal range of projectile at 30^o with horizontal is the same as that at an angle of ____ degrees

A) 45 B) 60 C) 90 D) 120

vii) The magnitudes of rectangular components of a vector are equal, if its angle with x-axis is ____ degrees

A) 0 B) 30 C) 45 D) 90

viii) Which is a correct record for the diameter of wire when measured by a screw gauge of least count 0.001cm?

A) 2.3cm B) 2.31cm C) 2.312cm D) 2.3124cm

ix) The vector A has the components A_x and A_y. The magnitude A is given by ____

A) $A_x - A_y$ B) $(A_x - A_y)^{1/2}$ C) $(A_x) - (A_y)^{1/2}$ D) $(A_x{}^2 + A_y{}^2)^{1/2}$

x) Motion of a projectile is ____

A) One dimensional B) Two dimensional C) Three dimensional D) Four dimensional

xi) Which one of the following is the correct record for the diameter of a wire when measured with a screw gauge of least count of 0.001 cm?

A) 2.3 cm B) 2.31 cm C) 2.312 cm D) 2.3124cm

xii) The unit of momentum in S.I. system is ____

A) Nm B) Nm^2 C) N^2m D) NS

xiii) The magnitude of dot and cross product of two vectors are $6\sqrt{3}$ and 6 respectively. The angle between them will be ____ degrees

A) 0 B) 30 C) 45 D) 60

xiv) One radian is equal to ____ rev.

A) 2π B) $\frac{\pi}{4}$ C) $\frac{\pi}{2}$ D) $\frac{1}{2\pi}$

xv) A cricket ball is hit so that it travels straight up in air and it acquires 3 seconds to reach the maximum height. Its initial velocity is ____

A) $10ms^{-1}$ B) $15ms^{-1}$ C) $29.4ms^{-1}$ D) $12.2ms^{-1}$

xvi) S.I unit of pressure is ____

A) Nm^2 B) N^2m C) Nm^{-2} D) $N^{-2}m$

xvii) The direction of a vector in space is specified by ____

A) 1 angle B) 2 angles C) 3 angles D) 4 angles

Q2) Write short answers of the following: 44 Marks

i) How many seconds are there in 1 year?

ii) Define physics and nuclear physics.

iii) Differentiate between precise and accurate measurements.

iv) What are the main frontiers of fundamental sciences?

v) Show that equation $s = v_i t + \frac{1}{2}at^2$ is dimensionally correct.

vi) Why do we find it useful to have two units for the amount of substance, kilogram and mole?

vii) Which are the dimensions and units of gravitational constant G in the formula $F = G\frac{m_1 m_2}{r^2}$

viii) If one of the rectangular components of a vector is not zero, can its magnitude be zero? Explain.

ix) Is it possible to add a vector quantity to a scalar quantity? Explain.

x) If all the components of vectors $\vec{A}_1$ and $\vec{A}_2$ were reversed, how it will alter $\vec{A}_1 \times \vec{A}_2$?

xi) Define the terms (i) unit vector (ii) position vector

xii) Under what circumstance would a vector have components that are equal in magnitude.

xiii) Can you add zero to a null vector?

xiv) Name the three different conditions that could make $\vec{A_1} \times \vec{A_2} = 0$

xv) Define impulse and show that how it is related to linear momentum.

xvi) What is the difference between uniform and variable velocity? Give S.I. units of velocity and acceleration.

xvii) A 1500 kg car has its velocity reduced from 20 ms^{-1} to 15 ms^{-1} in 3.0 seconds. How large was the average retarding force?

xviii) State Newton's second and third laws of motion.

xix) Differentiate between distance and displacement.

xx) State Newton's first and second laws of motion.

xxi) Why a motor cycle safety helmet is padded?

xxii) An object is thrown vertically upward. Discuss the sign of acceleration due to gravity relative to velocity, while the object is in air.

Give explanatory answer of the following: 24

3A) Three students measured the length of a needle with a scale on which minimum division is 1mm and recorded as (i) 0.2145m (ii) 0.21m (iii) 0.214m. Which record is correct and why?.

3B) Describe in detail various types of errors.

4A) Find the projection of vector $\vec{A} = 2i - 8j + k$ in the direction of vector $\vec{B} = 3i - 4j - 12k$.

4B) Define vector product of two vectors. Also write the characteristics of vector product of two vectors.

5A) Define projectile motion. Derive mathematical formula for its height and time of flight.

5B) Find angle of projection of a projectile for which its maximum height and horizontal range are equal.

11 -T1