ELIZADE UNIVERSITY
ILARA-MOKIN
ONDO STATE

FACULTY: Basic and Applied Sciences
DEPARTMENT: Physical and Chemical Sciences
FIRST SEMESTER EXAMINATIONS
2016/2017 ACADEMIC SESSION

COURSE CODE: PHY 101
COURSE TITLE: GENERAL PHYSICS 1
DURATION: 2 HOURS

HOD's SIGNATURE

TOTAL MARKS:

Matriculation Number: _____

INSTRUCTIONS:

1. Write your matriculation number in the space provided above and also on the cover page of the exam booklet.
2. This question paper consists of 2 pages with printing on both sides.
3. Answer all questions in the exam booklet provided.
4. More marks are awarded for problem solving method used to solving problems than for the final numerical answer.
5. Box your final answers.
6. Attempt any 4 questions, two from each section
7. Each question attracts 15 points.

SECTION A.

1(a) Mention two important applications of Dimension analysis.

(b) The velocity, V, of transverse waves along a string depends on the tension, F, in the string ,its length l and its mass m.

$$V = kF^x l^y m^z$$. Find x, y, z.

(c) (i) What is uniform velocity.

(ii) A train accelerates steadily from 58 km/hr to 82 km/hr in 20s. Find its acceleration.

2(a) Differentiate between displacement and velocity

(b) A cricket ball is thrown vertically upwards with a velocity of 24.5m/s

(i) calculate the time it takes to reach the highest point?

(ii) What is the greatest height from the ground?

(iii) how long does it take to return to the ground

3 (a) What is centripetal force?

(b) A ball of radius 5.0 cm rolls down an inclined plane from rest. After 4.0s, its angular velocity is 8.0 rad/s. Find (i) its angular acceleration (ii) its linear velocity after 4.0s.

(c) If $D = -5i + 6j - 3k$ and $E = 7i + 8j + 4k$

(i) Calculate $D \times E$

(ii) Find the angle between D and E

(iii) Show that $D \times E$ is perpendicular to both D and E

SECTION B

4(a) State and with mathematical illustration the second and third law of motion.

(b) A man stands on a scale in an elevator. If the scale reads 450 N when the elevator is stationary, what will it read when the elevator is

(i) ascending with an acceleration of $3ms^{-2}$

(ii) descending with acceleration of 3 ms^{-2}

(iii) moving at a constant speed.

5(a) State the law of conservation of energy.

(b) A tall man walks under a mango tree, a ripe fruit drops on his head from a height of 15m. if the speed of the fruit on hitting his is $12\,ms^{-1}$, determine how tall the man is.

6(a) Explain the following with suitable diagrams (i) Rolling Friction (ii) Fluid Friction.

(b) A 120 kg body moving at a speed of 20 ms^{-1} collides with a body that is half its weight and which is moving at twice its speed along same direction. After collision, the 120 kg body continues in the same direction with a speed of 25 ms^{-1} while the smaller body moves in in opposite direction. Find the final velocity of the smaller body.