MICHAEL AND CECILIA IBRU UNIVERSITY, AGBARHA-OTOR

FACULTY OF NATURAL AND APPLIED SCIENCES

DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE

SECOND SEMESTER 2017/2018 DEGREE EXAMINATIONS

COURSE CODE: PHY 108   LEVEL: 100

COURSE TITTLE: GENERAL PHYSICS LABORATORY II   [50 marks]

TIME ALLOWED: 1 Hour 30 mins

INSTRUCTION: Answer all Questions.

1. (a)   Mention and discuss three sources of experimental errors.   [9 marks]

   (b)   The centripetal force, F, of an object of mass, m, moving at a constant speed, v, along a circular path of radius, r, is given by

   $F = \frac{mv^2}{r}$.   If $m = 4.5 \pm 0.1$ kg, $v = 25 \pm 1$ ms^{-1}, and $r = 12.5 \pm 0.5$ m, calculate the

   (i)   maximum error in F;   [5 marks]

   (ii)   percentage error in F.   [2 marks]

2. The following readings were obtained from an experiment aimed at determining the acceleration due to gravity, g, using a simple pendulum.

Length, l (cm)	Time, t, for 10 oscillations (s)
10	6.3
25	10.4
37	12.2
45	13.8
67	16.7
75	17.6
82	18.4

(a) Plot a graph of the length, l, against the square of the period, T^2, of oscillation and use it to obtain the value of the acceleration due to gravity, g_1.

[10 marks]

(b) Plot another graph of the period, T, of oscillation against the square root of the length, $\sqrt{l}$, and use it to obtain the value of the acceleration due to gravity, g_2.

[10 marks]

(c) Determine the actual value of $g = \dfrac{g_1 + g_2}{2}$.

[2 marks]

(d) State two precautions that you would take if you were to perform the experiment in the laboratory.

[2 marks]

3. (a) In an experiment to determine the density of a certain liquid, a student measured the density of the liquid to be 8.0×10^{-4} gcm^{-3}. Express this result in S.I. unit.

[4 marks]

(b) Evaluate the following to three significant figures:

(i) $\sqrt{29}$ Nm^2 (ii) $\log 50$ N   (iii) $\sin 65^0$

[6 marks]