

FOCUS A365

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FORM 3 TERM 1 PHYSICS PP3 EXAMINATIONS 2018

NAME: _____ ADM NO: _____ CLASS: _____

INSTRUCTIONS TO CANDIDATES

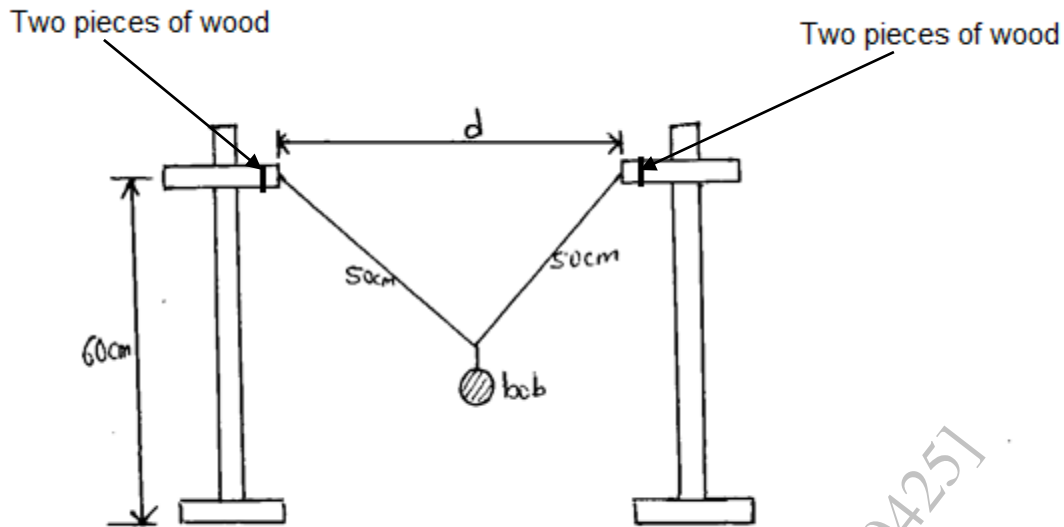
1. Write your name and admission number in the spaces provided.
2. Answer all question in the spaces provided.
3. All working must be clearly shown where necessary.
4. Non-programmable silent electronic calculators may be used.
5. Candidates should check the question paper to ascertain that all pages are printed as indicated and that no question is missing.

Question	Candidate's score	Max. Score
1		17
2		23
Total		40

- i) Two stands, two clamps and two bosses.
- ii) A metre rule
- iii) A pendulum bob
- iv) A piece of cotton thread about 120cm long
- v) A stop watch
- vi) Four pieces of wood

- a) Fix the bosses on the stands at points 60cm above the bench.
- b) Tie the piece of thread provided to the pendulum bob and arrange the set up as shown in the figure below.

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- Adjust the position of one of the stands so that the distance d , is 50cm.
- Displace the bob slightly so that it makes oscillations perpendicular to the plane containing the portions of the thread.
- Time ten oscillations and determine the period T . Record in the Table 1
- Repeat part (d) and (e) for values of $d=60\text{cm}$, 70cm , 80cm and complete the table shown below.

Table 1

Distance $d(\text{cm})$	50	60	70	80
Distance $d(\text{m})$				
Time, t 10 oscillations (s)				
Periodic time, $T(\text{s})$				

(6 mks)

- Plot a graph of d (y-axis) against periodic time T . (5mks)
- Determine the slope, S of the graph (3mks)
- Obtain the value k in the equation. (3mks)

$$S = \frac{-12\pi}{5k}$$

Question 2

You are provided with the following set of apparatus:

- A rectangular glass block
- 4 optical pins
- 4 thumb pins or office pins
- Soft board
- A white plan of sheet of paper
- A vernier callipers
- A complete mathematical set.

a) Using the vernier caliper measure the thickness t of the glass block.

t(cm) (1mk)

b) Express the thickness t in metres and in standard form

t(m) (1mk)

c) Fix the white sheet of paper on the soft board using the thumb pins or office pins.

d) Place the glass block on the white sheet of paper with one of its largest faces. Trace the outline of the glass block on the paper and label it PQRS as shown in the figure below.

e) Mark a point A on one of the large side PQ of the traced outline of the glass block as shown below. Point A should be 2cm from the point P.

f) Construct a normal AN at A. Draw a line at an angle $i = 10^\circ$ to the normal and stick pins P_1 and P_2 on it and replace the glass block on its outline PQRS.

g) Stick two other pins P_3 and P_4 so that they appear to be in a straight line with the images of object P_1 and P_2 in the block as viewed from the end SR as shown on the diagram below.

- h) Remove the glass block and draw the lines P_3 and P_4 to meet the outline of the block at the point B, and then join A to B.
- i) Measure the length x between A and B. Record in the table 2 below.
- j) Repeat the procedure for the angle of incidence 20° , 30° , 40° and 50° , then record the values in table 2 below.

Table 2

Angle of incidence i°	Length, x (cm)	x^2 (cm ²)	$1/x^2$ (cm ⁻²)	Sin i	Sin ² i
10					
20					
30					
40					
50					

(9mks)

- k) Plot a graph of $1/x^2$ (y-axis) against $\text{Sin}^2 i$ on the grid provided (5mks)
- l) Determine the slope, S and y-intercept of the graph
- i) Slope S (3mks)

ii) Y-intercept (1mk)

m) Given that the slope, S is given by the equation

$$S = \frac{\text{y-intercept}}{n^2}$$

n) What is the significant of the physical quantity n? (1mk)

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