Click to download more NOUN PQ from NounGeeks.com



NATIONAL OPEN UNIVERSITY OF NIGERIA PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA FACULTY OF SCIENCES

DEPARTMENT OF PURE AND APPLIED SCIENCE

2021_1 EXAMINATIONS

COURSE CODE:	PHY492
COURSE TITLE:	LABORATORY PHYSICS III
CREDIT UNIT:	3
TIME ALLOWED:	(2 ¹ / ₂ HRS)

INSTRUCTION:

Answer question 1 and any other four questions

QUESTION 1

A student carried out a light experiment and got the following readings:

Distance of object	Distance of image
from lens Ucm	from lens V cm
14.00	50.00
18.00	32.00
26.00	20.00
40.00	16.00
55	13.00

- a. Evaluate:
- i. (u + v) cm 1mk
- ii. $(uv)^2$ for each experiment 1mk
 - b. Tabulate your readings 1mk
 - c. Plot a graph of (u+v) against $(uv)^2$ 3mk
 - d. Determine the slope x 1mk
 - e. What is $\frac{1}{r}$ 2mks
 - f. Calculate the error from the slope 2mks
 - g. What is the radius of curvature r of the lens 1mk

h.

QUESTION 2

- a. Sketch the diagram for demonstration of half wave rectification 3mks
- b. Describe how the set up in 7a explains the action of the diode 3mks
- c. Does the connection to CRO affect the A.C. wave form? If so how 4mks
- d. What is the effect of connecting capacitors parallel to R when S is open 2mks

QUESTION 3

A student carried out an experiment to determine the real and apparent depth of a liquid and hence the refractive index. He used the travelling microscope method and obtained the following readings

Microscope readings

d i mm	do mm
7.0	2.0
8.0	2.5
9.0	3.0
10.11	3.3
12.0	4.0

If di = real depth and upward apparent displacement is do;

- i. Calculate the apparent depth = $d_2 = d_1 d_0 2mks$
- ii. $X = \frac{Real \, depth}{Apparent \, depth}$ 2mks

QUESTION 4

A student made 6 observations, he used signal generator, capacitor, inductor, voltmeter, ammeter and oscilloscope to perform an experiment. The output voltage was constant at 12V. The readings were:

Resistance R(Ω)	Current I (A)
20	8.00
40	7.20
60	6.50
80	5.00
100	4.50
120	3.80

- a. Tabulate your readings 1mk
- b. Evaluate V/1 = Z 1mk

 $Z^2 1 mk$

 \mathbf{R}^2 1mk

- c. Plot a graph Z^2 on the vertical axis & R^2 on the horizontal 4.5mk
- d. Determine the slope 2mk
- e. Find the error in the slope 1.5mk

QUESTION 5

In an optics experiment, a student got the following results from measurement:

d cm	L ₁ cm	L ₂ cm
90	75.6	55.6
80	62.6	25.6
70	59.0	23.0
60	46.5	21.4
50	33.0	20.9
40	20.0	25.0

- a. Evaluate the following and tabulate your readings
- $L = (L_1 L_2)$ 1mk
- L^2 1mk
- d^2 1mk
- $D = (d^2 L^2) 1mk$
- b. Plot a graph of D on the vertical axis and d on the horizontal axis 4mk
- c. Determine the slope 2mk
- d. Calculate the error in the slope 1mk
- e. Evaluate S/2 where S = slope

QUESTION 6

- a. $X_{\rm C} = \frac{1}{2\pi fc}$, $X_{\rm L} = 2\pi {\rm fl}$. Explain the symbol (3mk)
- b. What is the difference between resistance R, X_C and X_L3mks
- c. List 3 types of transistor configuration used in electronic circuit designs 1.5mk
- d. If the current gain in the common emitter npn transistor is given as $\beta = \Delta I_C / \Delta I_B$. Show that the voltage gain is Av.= $\beta R_C / R_b$ (4.5mk)

1mk

e.