NAME……..... INDEX NO…… /……

SCHOOL…… CANDIDATE'S SIGNATURE ……

DATE……..

232/3
PHYSICS
PAPER 3 (PRACTICAL)
JULY/AUGUST 2018
TIME:$2^1/_2$ HOURS
EXAMINATION 2018

INSTRUCTIONS TO CANDIDATES

1. Write your Name and Index number in the spaces provided above
2. Sign and write the date of examination in the spaces providedabove
3. Answer ALL the questions in the spaces provided in the question paper.
4. You are supposed to spend the first 15minutes of the $2^1/_2$hours allowed for this paper reading the whole paper carefully before commencing your work.
5. Marks are given for a clear record of the observations as soon as they are made.
6. Candidates are advised to record their observations as soon as they are made.
7. Mathematical tables are recommended electronic calculators may be used.
8. This paper consists of 7 printed pages.

FOR EXAMINER'S USE ONLY

Question 1	**b(i)**	**b(ii)**	**d**	**e(i)**	**e(ii)**	**e(iii)**
Maximum score	2	1	6	5	3	3
Candidate's score						

TOTAL 20

Question 1	**xiv**	**xv(i)**	**xv(ii)**	**b**	**c**
Maximum score	8	5	3	2	2
Candidate's score					

TOTAL 20

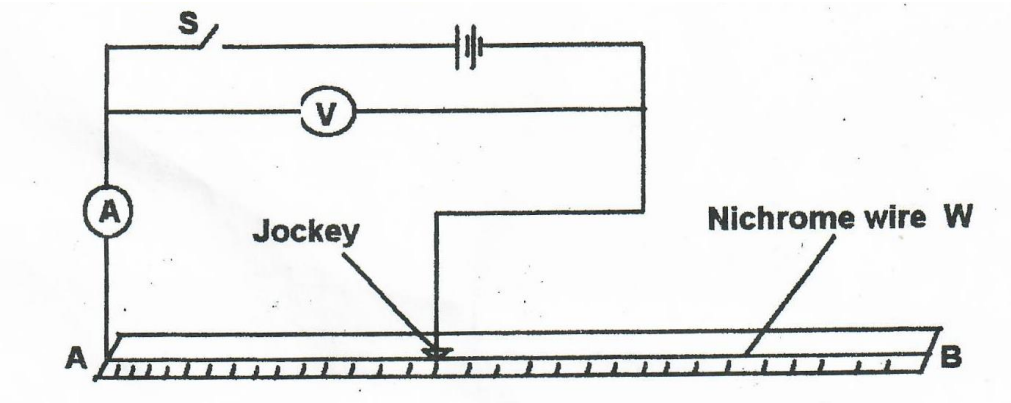
GRAND TOTAL 40

QUESTION 1

1. You are provided with the following
    - Two cells of 1.5V each
    - Nichrome wire mounted on a metre rule
    - An ammeter (0-1.5A) or (0-2.5A)
    - A cell holder
    - A voltmeter (0-5)v
    - 8 Connecting wires (4 with crocodile clips)
    - A switch
    - A metre rule

Proceed as follows

a) Connect the circuit as shown below



b) Connect the jockey at B

i) Close the switch and measure both the current I and p.d. V across the wire AB

Current (1mark)

Voltage (1mark)

ii) Measure the e.m.f of the cell E= 3.0V (1mark)

c) Reduce the length AB by tapping the Jockey at 100cm, 60cm, 50cm, 40cm, 30cm, and 20cm. In each case record current 1 and p.d

d) Enter the values as shown below in the chart (6mks)

Length (AB)cm	**100**	**70**	**60**	**50**	**40**	**30**	**20**
Current I(A)	**0.12**	**0.18**	**0.20**	**0.22**	**0.24**	**0.26**	**0.32**
p.d. V (v)	**2.4**	**2.2**	**2.1**	**1.9**	**1.8**	**1.6**	**1.5**
E – V(V)	**0.6**	**0.8**	**0.9**	**1.1**	**1.2**	**1.4**	**1.5**

e) (i) plot a graph of (E-V) against current I (5mks)

(II) Determine the gradient of the graph (3mks)

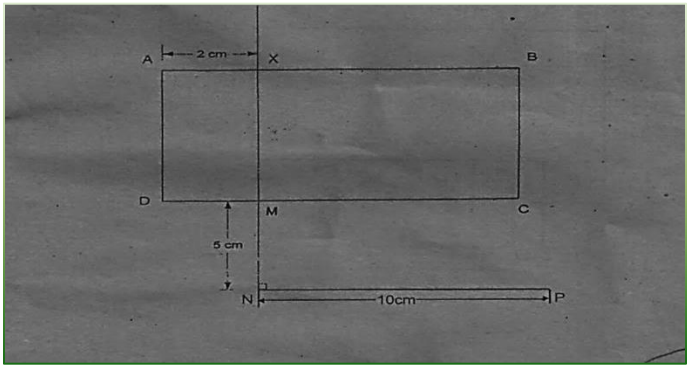
(iii) Given the equation, E=V+Ir determine the internal resistance of each cell (3mks)

QUESTION 2

2. You are provided with the following apparatus
    - A glass block
    - Soft board
    - Plain paper
    - Four optical pins
    - Four thumb pins
    - A protractor
    - A ruler

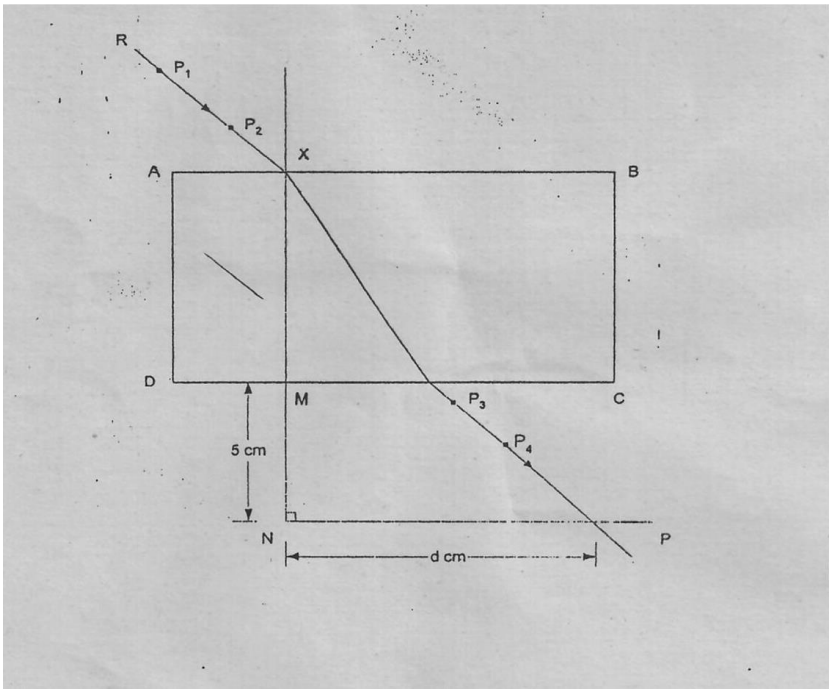
i. Fix the plain paper on the soft board using the four thumb pins
ii. Place the glass block on the plain paper (that is fixed on the soft board). Let the glass block rest on the paper from the broader face.
iii. Trace the glass block using a pencil.
iv. Remove the glass block.

Mark point X one of the longer side of the traced glass block as shown in the diagram below.
Point X should be 2cm from edge A.



v. Construct a normal at X, to emerge through line DC. Let this normal meet line DC at point M.
vi. Mark point N along the emergent normal, 5cm from M.
vii. Construct a line NP to meet the normal at N at 90^0. Line NP is 10cm.
viii. Using a protractor, construct an incident ray RX at an angle of incidence **i** $=10^0$. Fix two point P_1 and P_2along RX
ix. Replace the glass block to the traced figure.
x. View the path of the incident ray RX through the glass block from the face DC. Using other two pins P3 and P4, fix them to seem to align themselves with images of P_1 and P_2
xi. Remove the glass block and draw the emergent ray through P_3 and P_4

xii. Measure the distance of the emergent ray from point N along line NP as shown in the diagram below.



xiii. Record the corresponding values of d, Sin **i** and Sin^2**i** in the table below.

xiv. Repeat the procedure for other values of **i** (8 marks)

Angle of incidence i^0						
Distance d (cm)						
Sin i						
Sin^2i						

(xv) (i) On the grid provided, plot the graph of Sin^2i (vertical axis) against d (5mks)

(ii) Calculate the gradient of the graph (3marks)

(iii) What is the equation of the graph? (2marks)

c) Give the value of d when $i=80^0$ (2marks)