INDEX NO. ....DATE ....SIGN. ....

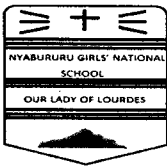| Date done	
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Date revised	

232/2: PHYSICS PAPER TWO

NYABURURU GIRLS– JUNE SERIES 2016
Kenya Certificate of Secondary Education
Physics Paper 2
2 Hours

INSTRUCTIONS TO CANDIDATES:
1. Write your name, class, admission number and index number is the spaces provided above.
2. Sign and write the date of examination in the spaces above.
3. Answer **ALL** the questions in section **A** and **B** in the spaces provided.
4. All working **MUST** be clearly shown.
5. Non-programmable silent electronic calculators and KNEC mathematical tables may be used.
6. Candidates should check the question paper to ascertain that **ALL** the pages are printed and that no questions are missing.

FOR EXAMINER'S USE ONLY.

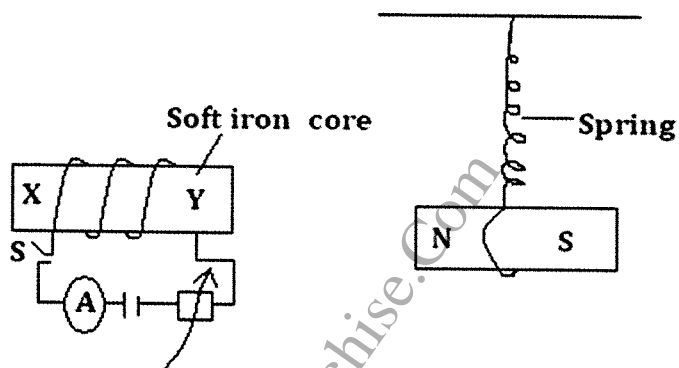| SECTION	QUESTIONS	MAX. SCORE	CANDIDATE'S SCORE
A	1 -12	25	
B	13	09	
	14	13	
	15	13	
	16	10	
	17	10	
	TOTAL	80	

SECTION A (25 MARKS)

1. State two ways of increasing the size of an image formed by a fixed pinhole camera. (2 marks)

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2. The diagram below shows a permanent magnet suspended by a spring. It is placed near a circuit as shown below.

State with reason the behaviour of the magnet when the switch is closed. (2 marks)

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3. State two factors that affect the speed of sound in air. (2 marks)

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4. State two functions of the anode in a C R O. (2 marks)

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5. Complete the following nuclear reaction by identifying the values of X and Y. (1 mark)

$$^{234}_{91}P_o \rightarrow {}^{X}_{92}U \rightarrow {}^{230}_{Y}T_h$$

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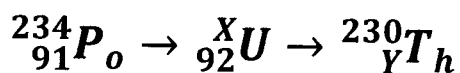
6. State the importance of doping in electronics

(1 mark)

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7. A negatively charged rod is brought near the cap of lightly charged electroscope. The leaf divergence first reduces but as the rod comes nearer, it divergences further.
   i) State the charge on the electroscope.

(1 mark)

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   ii) Explain the behaviour of the leaf.

(2 marks)

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8. Sketch a ray diagram to show position of image formed by concave mirror when an object is placed at the focal point.

(3 marks)

9. You are provided with three resistors of 3Ω, 2 Ω and 1 Ω. Arrange the resistor in a circuit so as to have minimum resistance and determine the effective resistance.

(3 marks)

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10. You are provided with the following apparatus:

- Connecting wires
- An ammeter
- Fixed resistor
- A voltmeter
- A variable resistor
- Switch
- 2 dry cells in a cell holder

In the spaces below, draw the circuit that can be used using the apparatus above to verify Ohm's Law.

(3 marks)

11. Sketch a graph of forward bias characteristics of p – n junction diode.

(1mk)

12. A consumer has the following appliances operating in his house for the times indicated.

Appliance	Time
Two 4W bulbs	30 min
One 500W fridge	10 hrs
Four 75W bulbs	3 hrs
One 3W electric heater	45 mins
One 100W television	5 hrs

Calculate the total electrical power consumed in KWh in 30 days, assuming that the power consumption per day is the same.

(2 marks)

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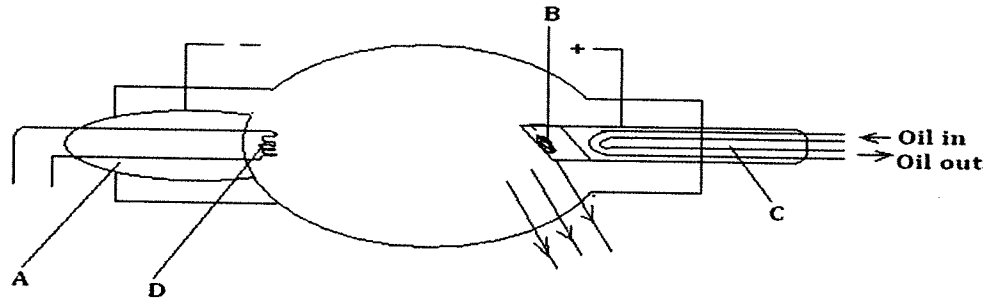
SECTION B (55 MARKS)

Answer all questions in the spaces provided.

13. The diagram below shows an X-Ray tube.

a) State the functions of A and C.

(2 marks)

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b) What adjustments on the X-ray tube will
   i) Increase the hardness of the X-rays.

(1 mark)

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   ii) Reduce the intensity of the X-rays.

(1 mark)

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c) An X-ray tube has an accelerating pd of 50KV. Determine the shortest wavelength of its X-ray beam (planks constant = 6.63 x 10⁻³⁴ Js, charge of an electron = 1.6 x 10⁻¹⁹C, velocity of light = 3.0 x 10⁸ms⁻¹

(3marks)

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d) Give two advantages of a CRO as a voltmeter.

(2 marks)

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14. a) The figure below shows rays of light entering a human eye which has a defect.
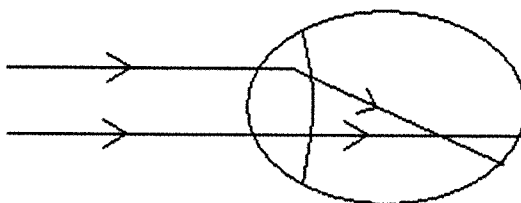
   i) Name the defect. (1 mark)

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   ii) State two possible causes of the defect. (2 marks)

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iii) Sketch a ray diagram to show how the defect can be corrected. (2 marks)

b)   Three rays are spreading from a point E at the bottom of the tank containing a liquid as shown below.
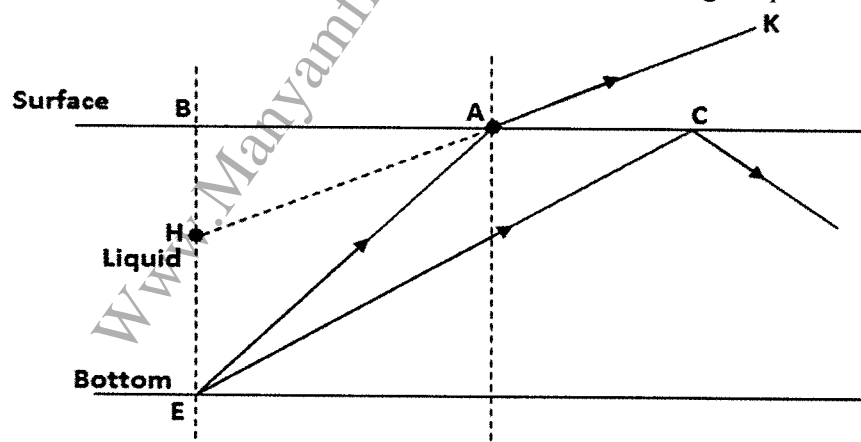
   a) What name is given to the bending of the ray at A? (1mk)

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   b) What name is given to the dotted length from H to B? (1mk)

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   c) Using a ruler to measure appropriate values calculate the refractive index. (2mks)

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c) A ray is incident at right angles at the face AB, of a right angled isosceles prism of refractive index 1.6 as shown in the figure below.
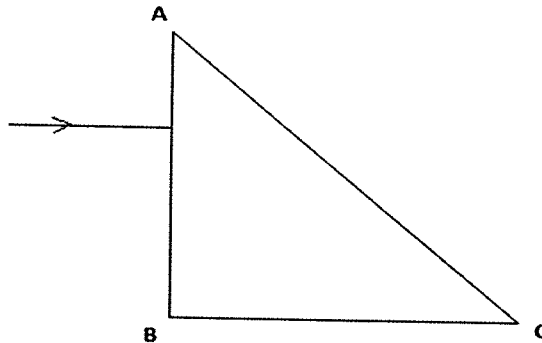
If the prism is surrounded by a liquid of refractive index 1.40, Determine

   i) The angle of incidence on the face AC.   (1 mark)

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   ii) The angle of refraction on the face AC.   (3 marks)

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15. a) Define capacitance of a capacitor.   (1 mark)

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   b) State two factors affecting capacitance of a parallel plate capacitor.   (2 marks)

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c) i) Sketch a graph of variation of current against time as a capacitor is being discharged.   (1 mark)
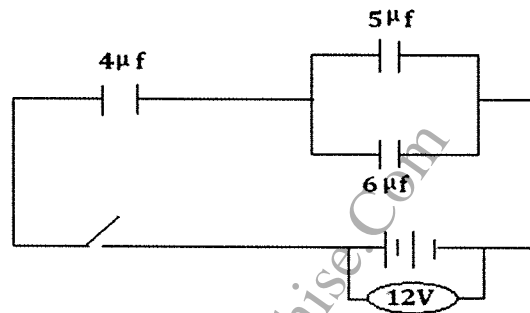
ii) Explain the shape of the graph. (2 marks)

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d) The diagram below shows 3 capacitors of 4μf, 5μf and 6μf connected to 12V dc supply.

Find
i) The effective capacitance. (3 marks)

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ii) The charge stored in the 4μf capacitor. (2 marks)

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iii) Energy stored in the circuit (2mks)

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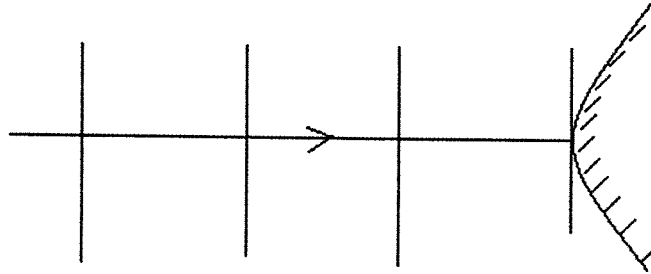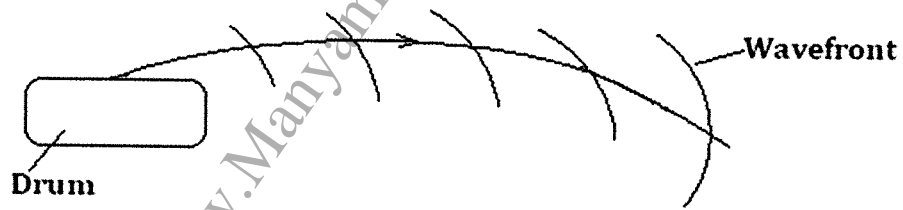
16. a) The figure below shows a straight wavefronts incident on a convex reflector. Complete the diagram to show the reflected wavefronts. (2 marks)

b) Explain why narrow slits cannot be used to demonstrate interference of sound waves. (2 marks)

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c) The figure below shows sound waves emitted by a struck drum.

Explain the behaviours of the wavefronts. (2 marks)

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d) The diagram below shows a vibrating string fixed at the ends.
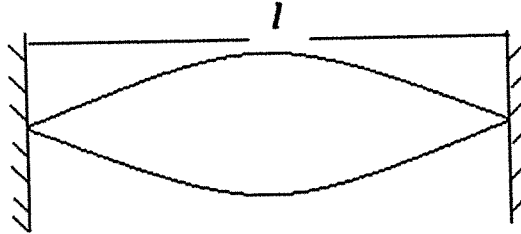
If the vibration has a frequency of 200Hz and the wave velocity is 200ms^{-1}. Calculate

i) Wavelength of the wave. (2 marks)

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ii) Length of the string. (2 marks)

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17. a) Define the term work function. (1 mark)

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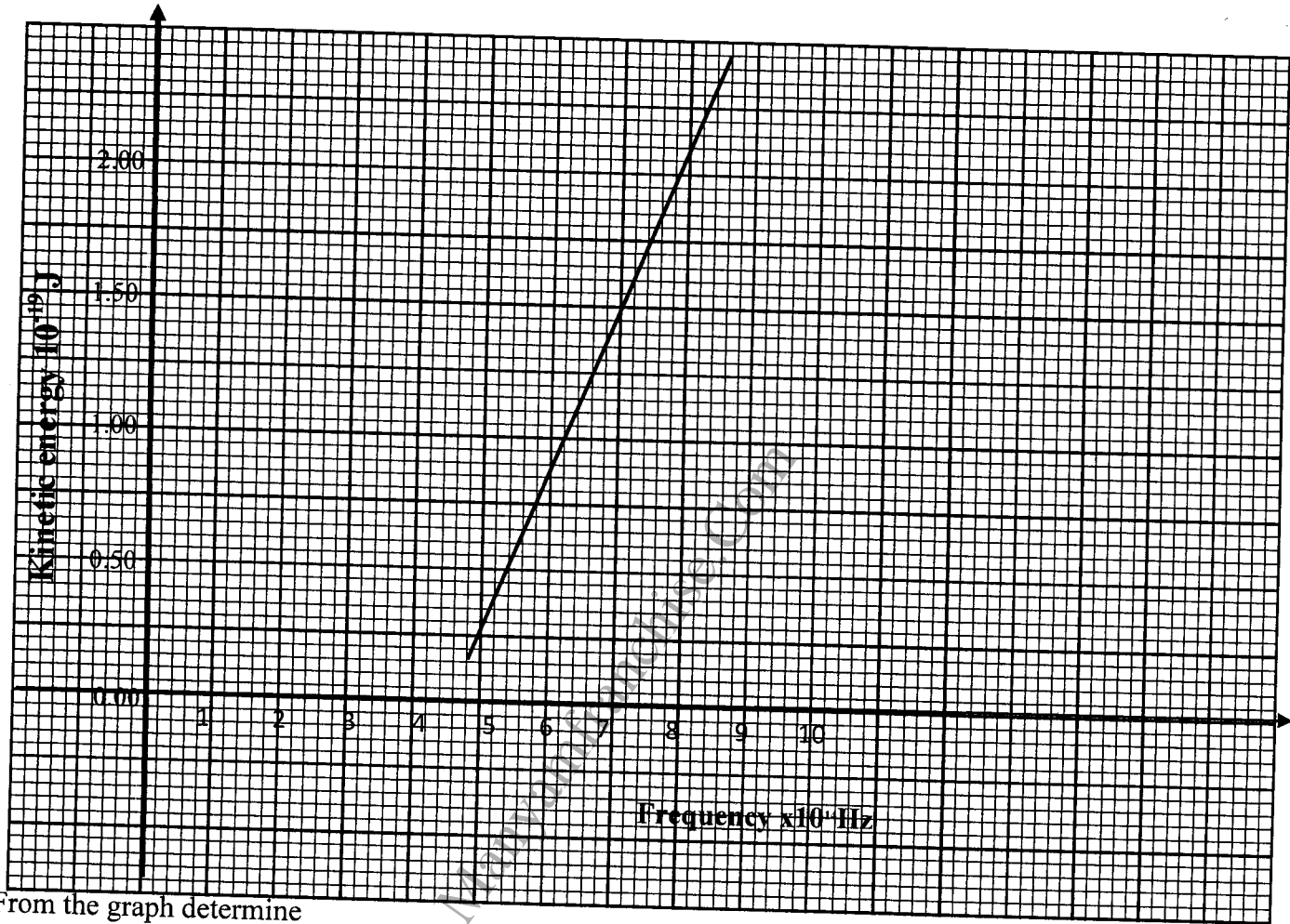
b) A student investigated how the maximum kinetic energy of photoelectrons emitted from a zinc metal surface varies with the frequency of the incident radiation. The results obtained were plotted as shown on the graph below.

From the graph determine

i) The Planck's c3onstant. (2 marks)

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ii) The work function of the metal. (3 marks)

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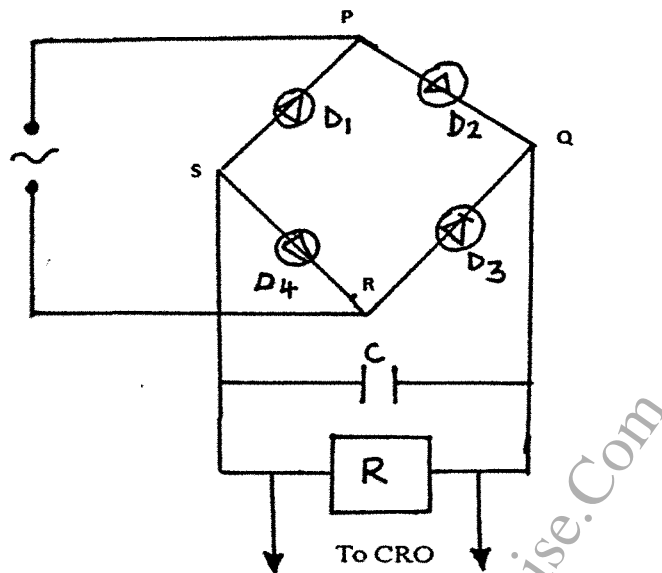
d) The figure shows a rectifier circuit for an alternating current input using four diodes.

i)   Explain how rectification is achieved   (2mks)

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ii)   State the function of the capacitor C in the circuit   (1mk)

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iii)   Sketch a graph to show how the voltage across the resistor R varies with time   (1mk)

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