NAME.....CLASS.....C/NO.....ADM/NO.....INDEX/NO.....

232/2
FORM THREE
PHYSICS
PAPER 2
2016 MARCH SERIES,
2 HOURS

Candidate's signature.....

NYABURURU GIRLS'SCHOOL
MARCH SERIES EXAMINATION

Date done	
Invigilator	
Date returned	
Date revised	

Instructions to Candidates

(a) Write your name, class and class number in the spaces provided above.
(b) Sign and write the date of examination in the spaces provided above.
(c) This paper consists of **TWO** sections: **A** and **B**.
(d) Answer **all** the questions in both sections **A** and **B** in the spaces provided.
(e) **All** working **MUST** be clearly shown.
(f) Non-programmable silent electronic calculators may be used.
(g) **This paper consists of 12 printed pages.**
(h) **Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.**
(i) **Candidates should answer questions in English.**

FOR EXAMINER'S USE ONLY

Section	Question Number	Maximum score	Candidate's Score
A	1 -12	25	
	13	07	
	14	08	
	15	11	
	16	07	
	17	11	
	18	11	
	Total	80	

NAME.....CLASS.....C/NO.....ADM/NO.....INDEX/NO.....

SECTION A (25MKS)

1) Give two illustrations that shows light is propagated linearly. (2mks)

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2) Distinguish potential difference from electromotive force. (2mks)

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3) A ball of radius 7cm rolls on a level ground a distance on 70m in 2 seconds, determine the periodic time of the rolling ball. (3mks)

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4) Using domain theory explain the meaning of magnetic saturation. (2mks)

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5) State two applications of parabolic reflectors. (2mks)

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6) Give a reason why a U-shaped core makes a stronger electromagnet than a straight core. (1mk)

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NAME.....CLASS.....C/NO.....ADM/NO.....INDEX/NO.....

7) Explain why prisms are preferred to plane mirrors for use in periscopes. (2mks)

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8) State one difference between radio waves and sound waves. (1mk)

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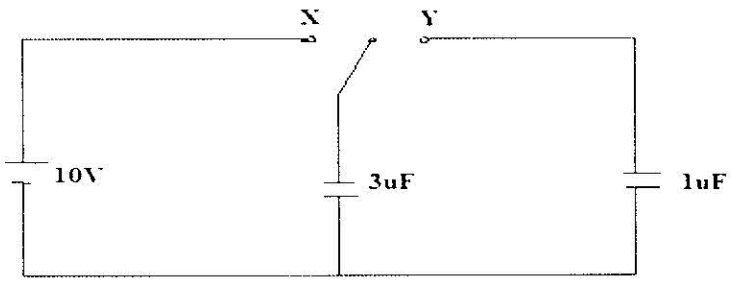
9) The figure below shows a conductor carrying current in the magnetic field. On the same draw magnetic field lines and show the direction of force. (3mks)

10) In the circuit shown below a $3\mu F$ capacitor is charged from a 10V battery by connecting the switch to terminal X. The switch is then connected to Y charge the $1\mu F$ capacitor from the $3\mu F$ capacitor. Calculate the total energy in the parallel arrangement. (3mks)



11) State two factors to consider when charging an accumulator. (2mks)

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12) Explain how a candle flame makes the electroscope discharge. (2mks)

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NAME.....CLASS.....C/NO.....ADM/NO.....INDEX/NO.....

SECTION B (55MKS)

13) a) state Snell's law (1mk)

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b) Using a diagram, explain why the sun is seen above the horizon before it rises (2mks)

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(c) The refractive index of glass is $3/2$ and that of water is $4/3$. Calculate the refractive index of glass with respect to water. (2 mks)

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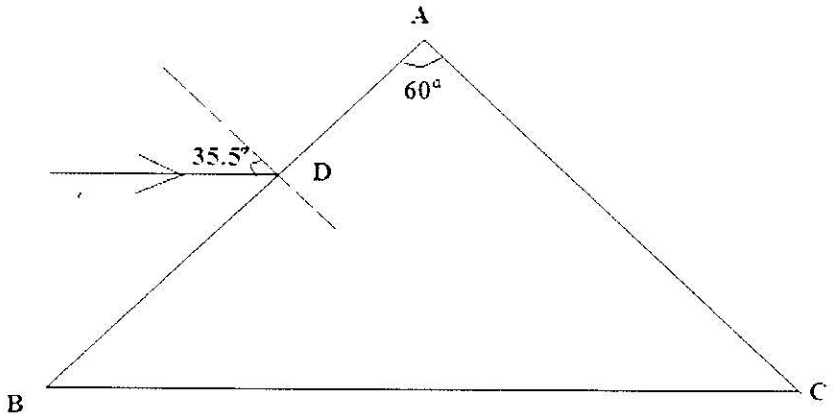
d) The figure below shows a ray of light incident at an angle of 35.5° at point D on the first face of a glass prism ABC. The refractive index of the prism is 1.6. Draw the ray diagram until the ray gets out of the prism. (2mks)



14) a) What is "Background count" in relation to radio activity. (1mk)

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b)Radon nuclide $^{222}_{86}Ra$ decays to form polonium(Po) by emitting an alpha-particle. Use a suitable equation to show this decay. (2mks)

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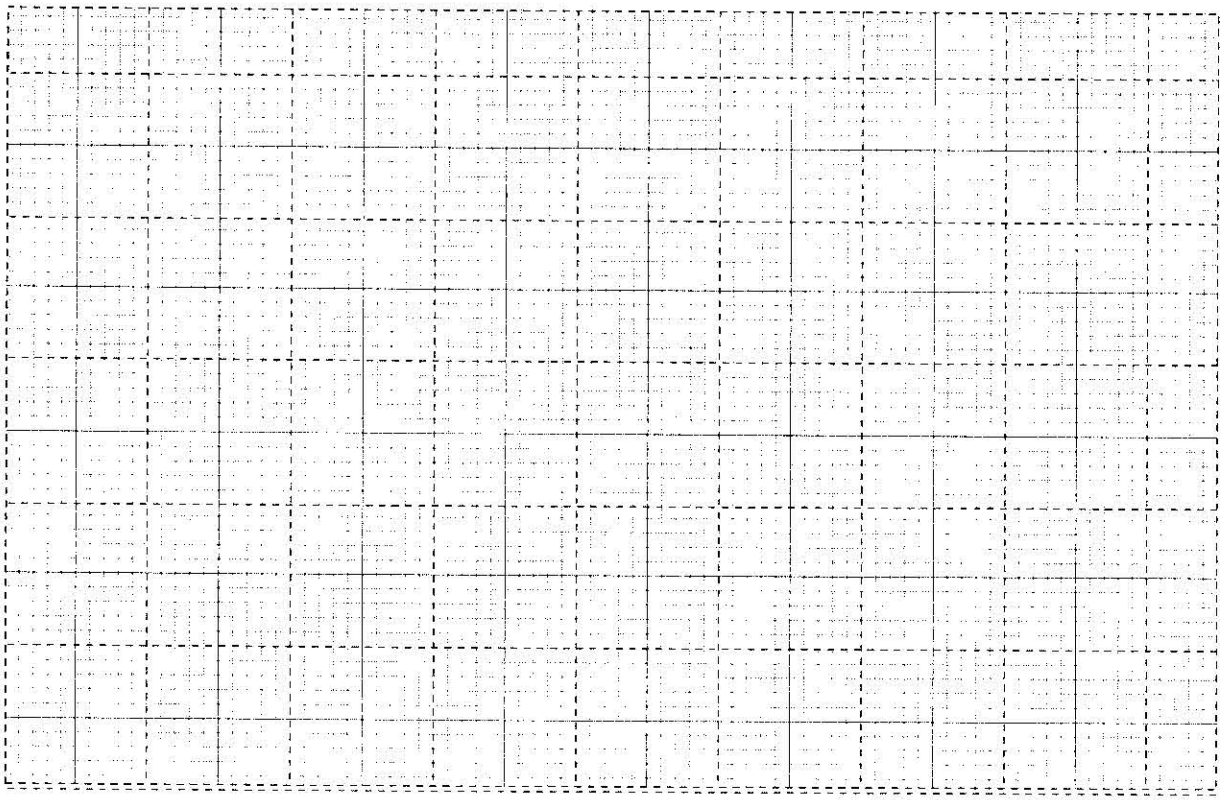
c) A source of beta radiation is held near a GM tube which is connected to a ratemeter. The table below shows how the count-rate recorded by the ratemeter varies with time.

Time(minutes)	0	5	10	15	20
Count-rate(counts per second)	1660	1100	750	510	350
Actual count-rate per second					

If the count-rate due to background radiation is 6000 counts per minute, find the half-life of the source by plotting a graph on the graph paper provided. (5 mks)



15) (a) What is meant by threshold wavelength? (1 mk)

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(b)Explain how intensity of radiation incident on a metal surface affects the photoelectrons emitted. (1 mk)

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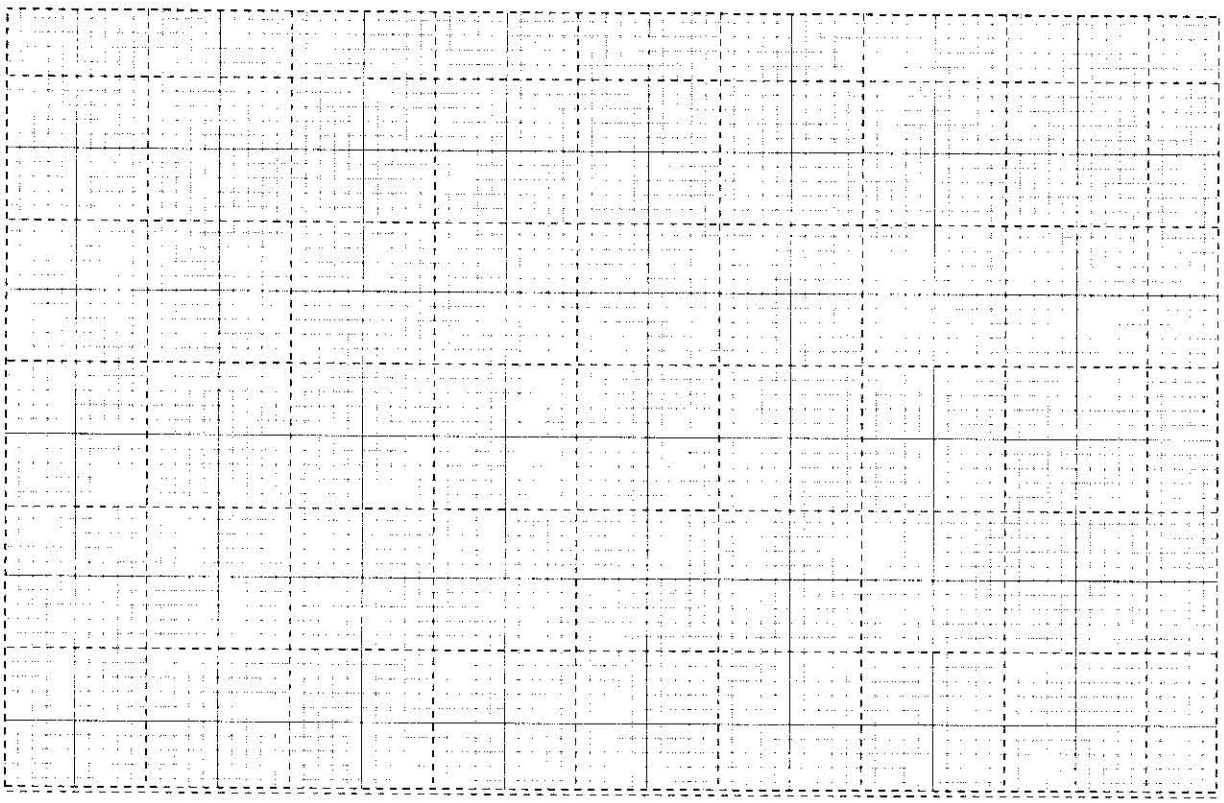
(c) In an experiment using a photocell, light of varying frequency but constant intensity was made to strike a metal surface. The maximum kinetic energy of the photoelectrons for each frequency, f, was measured. The values obtained are shown in table below

Maximum K.E ($X 10^{-19}$)	2.8	5.4	7.4	9.0	10.0	11.0
Frequency ($X 10^{15}$) HZ	1.5	1.9	2.2	2.42	2.57	2.75

i) Plot a graph of maximum K.E against frequency. (4 marks)



ii) From the graph determine the values of Planck's constant and the work function of the metal surface.

I) Planks constant (3 mks)

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II) Work function (2 mks)

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16) a) State one similarity between a concave lens and a convex mirror. (1mk)

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b) A lens forms a focused image on a screen when the distance between the object and the lens is 100cm. The size of the image is twice that of the object.

i) State with reason the type of lens used (2mks)

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ii) Determine the distance of the image from the lens. (2mks)

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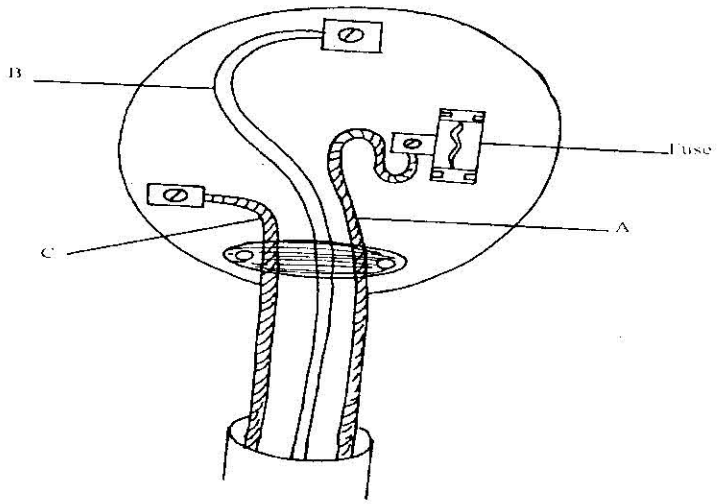
c) The figure shows a connection to the pin plug.



i) State the colour of the leads labelled A, B and C. (3mks)

A

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B

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C

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ii) Explain why is the earth pin normally longer than the two pins. (1mk)

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iii) State the function of the fuse (1mk)

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d) The power company supplied electrical energy and charges the consumption to ordinary domestic wiring as follows;

- A monthly fixed charge of Ksh. 75
- Ksh. 1.55 per unit for the first 50 units consumed.
- Ksh. 6.65 per unit for the next 51- 300 units
- 1 unit = 1kilowatt- hour (kwh)

NAME.....CLASS.....C/NO.....ADM/NO.....INDEX/NO.....

A consumer uses 1.98×10^5 kilojoules of electrical energy in a given month. Determine the total month bill. (3mks)

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18) a) State Lenz's law of electromagnetic induction. (1mk)

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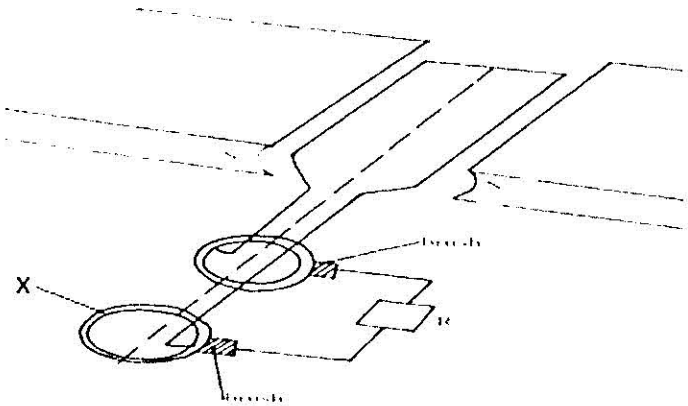
b) The diagram below is a simplified illustration of an e.m.f generator.



i) Name the part labelled A. (1mk)

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ii) Show the direction of induced e.m.f when the coil is in the position shown in the diagram. (1mk)

iii) State two ways of increasing the amount of induced e.m.f in this set up. (2mks)

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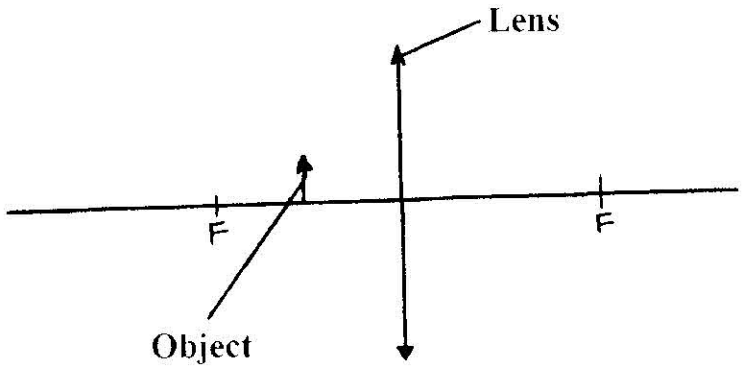
c) The figure shows an object placed between F and the lens of a convex lens.Use ray diagrams to locate the position of the image. (2mks)



17) a) Give one advantage of transmitting mains electricity as a.c and not d.c. (1mk)

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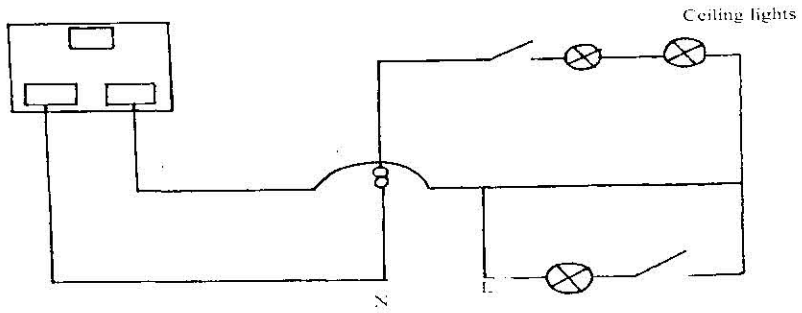
b) The figure below shows part of a wiring circuit for a house.



Identify two faults in the wiring. (2mks)

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c) Give a reason why the output from this generator can not be used to charge a battery. (1mk)

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d) State and explain any two ways by which energy losses are minimized in a transformer. (2mks)

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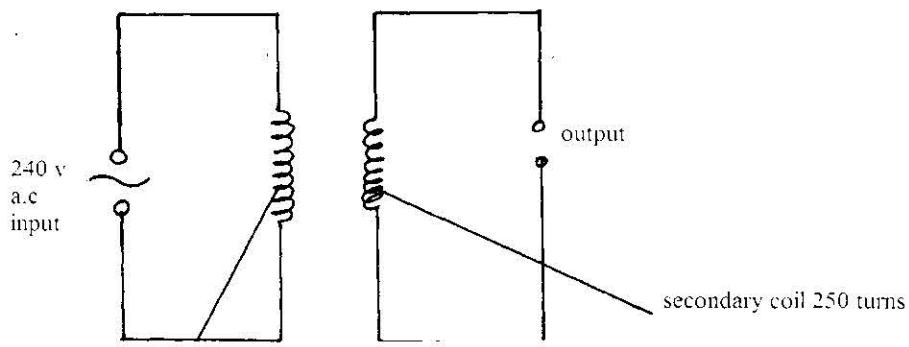
e) A person has a 6v bell. He hopes to operate the bell from a 240v a.c mains supply, with the help of the transformer shown in the figure.



Calculate the output voltage of the transformer when connected to the 240v mains. (3mks)

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