NAME: …… INDEX NO: ……..……

SCHOOL: …… Candidate's signature: ……..

Date: ……

232/2
PHYSICS
PAPER 2
(THEORY)
TIME: 2 HRS

LOWER YATTA DISTRICT JOINT EVALUATION EXAM- 2011

Kenya Certificate of Secondary Education (K.C.S.E)

232/2
PHYSICS
PAPER 2
(THEORY)
TIME: 2 HRS

INSTRUCTIONS

1. Write your name and your Index number in the spaces provided.
2. This paper consists of **two** sections, Section **A** and **B.** Answer **ALL** the questions in both section in the spaces provided in this paper.
3. **ALL** working must be clearly shown.
4. Mathematical tables and electronic calculators **may be** used.

FOR EXAMINER'S USE:

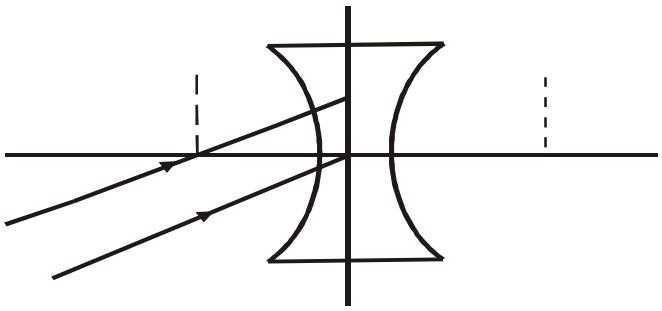
SECTION	QUESTION	MAXIMUM SCORE	STUDENTS SCORE
A	1-9	25	
B	10	06	
	11	14	
	12	10	
	13	18	
	14	07	
	TOTAL	**80**	

This paper consists of 12 printed pages
Candidates should check to ensure that all pages are printed as indicated and no questions are missing

 Turn Over

SECTION A (25 MARKS)

1. a) The figure below shows two parallel rays incident on a concave lens.



Complete the diagram to show the effect of the lens on the rays. (2 marks)

b) State the conditions under which total internal reflection occurs. (2 marks)

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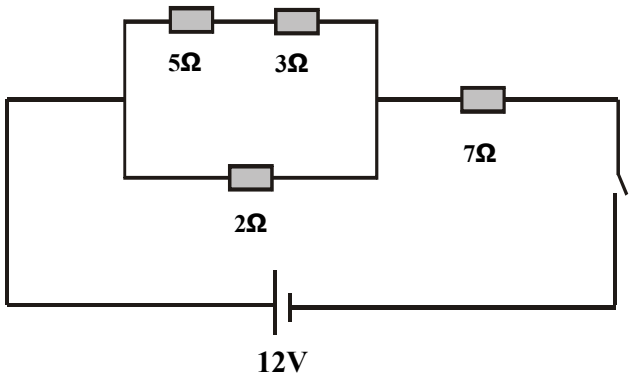
2. A policeman standing between two cliffs fires a gun and hears the first echo after 4.2s later and the next echo after further 2.8s. If the velocity of sound in air is $340m^{-1}$, find the distance between the two walls. (3 marks)

3. The figure below shows a 12V battery connected to a network of resistors. Calculate the current flowing through the 2Ω resistor. (4 marks)



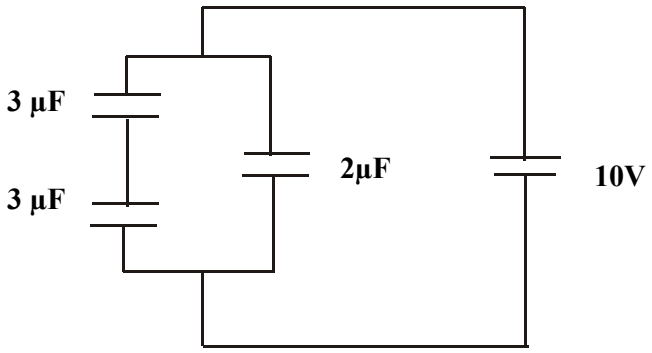
4. The diagram below shows two parallel current carrying conductors A and B placed close to each other.

On the figure,

i) Sketch the magnetic field pattern. (2 marks)

ii) Indicate the force F due to the current on each conductor. (1 mark)

5. The figure below shows an arrangement of the capacitors connected to 10V d.c supply.

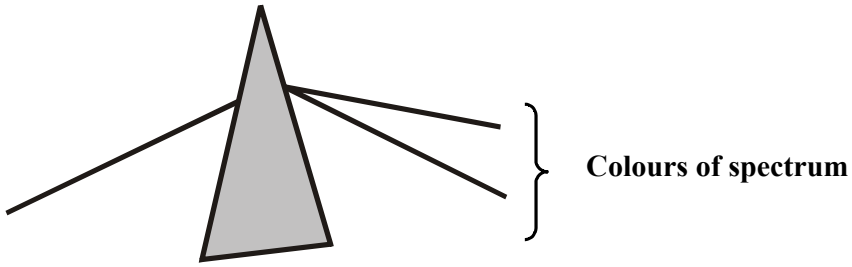


Determine the:

i) Charge stored in the 2 μF capacitor. (2 marks)

ii) The combined capacitance of the arrangement. (2 marks)

6. A ray of light incident on the surface of glass prism is observed to behave as shown below.



Explain its observation. (2 marks)

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7. How can it be shown that the strength of a magnet is concentrated at the poles? (2 marks)

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8. State **two** effects that would be observed when water waves pass from deep to shallow water. (2 marks)

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9. State the type of wave produced when a stretched wire is plucked. (1 mark)

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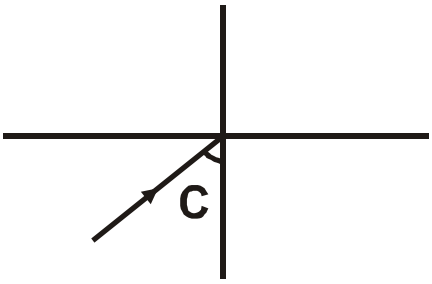
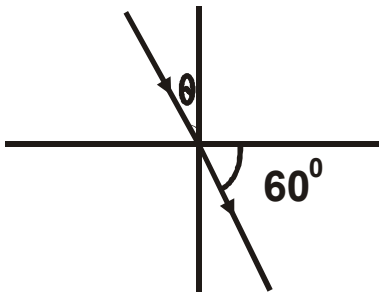
SECTION B (55 MARKS)

10. a) The diagram below shows a ray of light striking a water glass interface.



Show that $_{w}n_{g} = \frac{1}{\sin C}$. (3 marks)

b) Calculate the angle θ below if the refractive indices of glass and water are $\frac{3}{2}$ and $\frac{4}{3}$ respectively.



c) i) State Snell's law of refraction. (1 mark)

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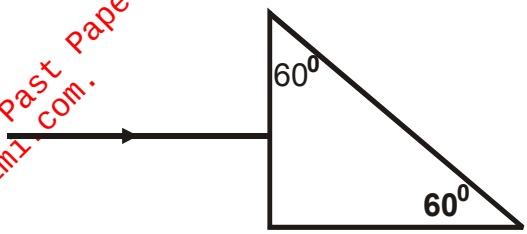
ii) The figure below shows a glass prism of refractive index 1.5.



Trace the path of the ray until it emerges. (2 marks)

11. a) Highlight **two** conditions that are necessary for interference to occur. (3 marks)

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b) During young's double slit experiment using a red light, state the effect of the following procedure on the interference fringes.

i) Decreasing the slit separation. (1 mark)

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ii) Minimizing the distance between the slits and the screen. (1 mark)

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iii) Covering one of the slits. (1 mark)

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iv) Enlarging the slits. (1 mark)

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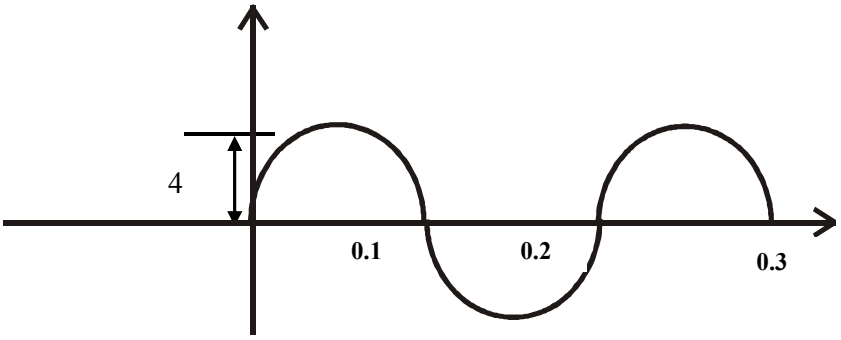
c) Water waves are observed as they pass a fixed point with 20 crests per minute. A particular wave crest takes 2 seconds to travel between two fixed points 8 metres apart.

Determine the wave:

i) The frequency. (1 mark)

ii) The wave length. (3 marks)

d) The diagram below shows a wave form.



Given that the velocity of the wave is $2.8m^{-1}$, determine the wave length. (3 marks)

12. a) An electric kettle is made of a wire whose resistance is 80 Ω and connected to a 240 mains supply.

Determine the

i) Power rating of the heater. (2 marks)

ii) Current flowing in the device. (2 marks)

iii) The cost of using the heater for 3 hours a day for 30 days.(Take KPLC rates to be 5/= per KWh) (3 marks)

b) Two heaters A and B are connected in parallel across a 240V mains supply. Heater A is rated 1000W and B is rated 2500W. Calculate the ratio of their resistances, R_A/R_B. (3 marks)

13. a) State Ohms law. (1 mark)

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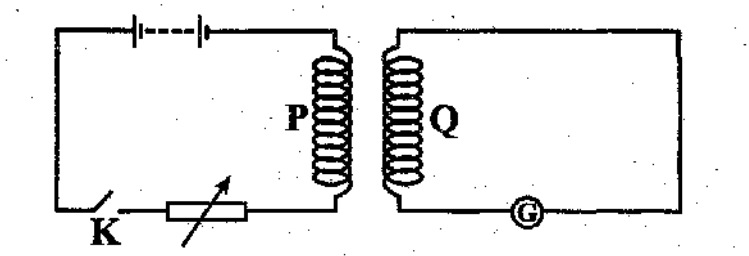
b) You are provided with: resistance wire, a 2V d.c power supply, ammeter, a voltmeter, connection wire and rheostat. Describe with a diagram how you would verify ohms law. (6 marks)

c) Two coils P and Q are placed close to each other as shown in the figure below. P is connected to the battery, rheostat and a switch while Q is connected to the galvanometer G.



State with reason the behavior of the pointer of the galvanometer in each of the following cases:

i) When the switch is closed. (2 marks)

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ii) When the switch is open. (2 marks)

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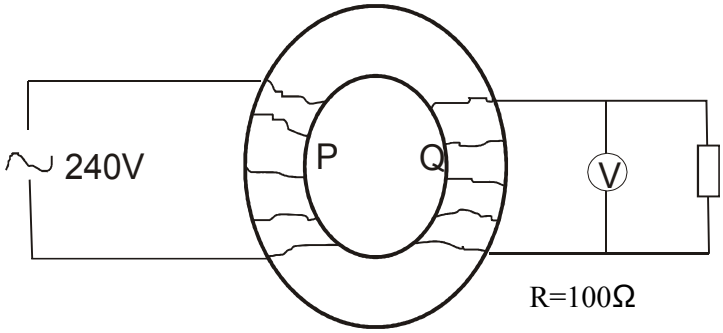
d) The coils P and Q are wound on a soft iron core as shown in the figure below.



P has 1200 turns while Q has 500 turns. Resistance of Q is negligible and that of load R is 100 Ω.

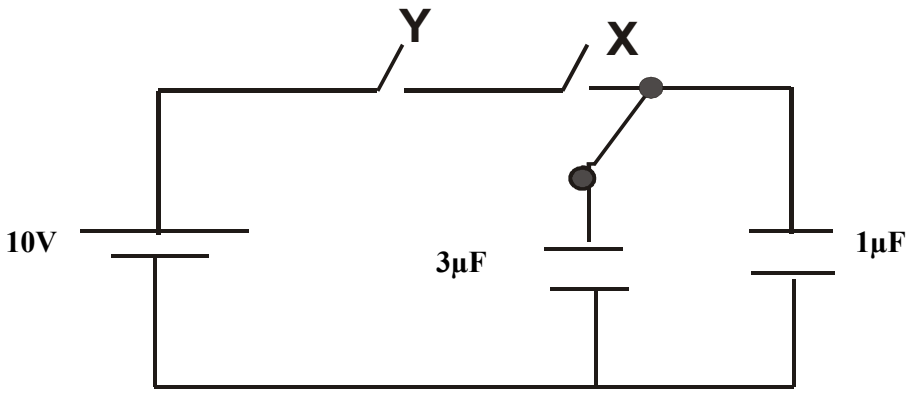
Calculate:

i) Voltage measured by the voltmeter. (3 marks)

ii) Current in the coil Q. (2 marks)

iii) The current in the coil P. (2 marks)

14. In the circuit diagram below, a 3μF capacitor is charged from a 10V battery by connecting the switch to terminal X.



The switch is then connected to terminal Y to charge the1μF capacitor from the 3 μF capacitor.

Calculate:

i) Energy initially stored in the 3 μF capacitor. (2 marks)

ii) The final charge across the parallel arrangement. (3 marks)

b) What is the function of the copper strip in a lightening arrestor? (1 marks)

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